název: CHEMICKÁ STAVEBNICE

téma: DERIVÁTY KARBOXYLOVÝCH KYSELIN

Sestavila: ***Karla Čechová***, 4. ročník, UCHB

METODICKÉ POKYNY

Stavebnice je určena na procvičování funkčních a substitučních derivátů karboxylových kyselin. Skládá se ze dvou částí (substituční deriváty a funkční deriváty), které je možné používat jak odděleně, tak dohromady.
Jedná se o soubor rovnic, které znázorňují přípravy zadaných sloučenin, popřípadě jejich významné reakce. Stavebnicí lze procvičit také názvosloví.

Žáci se rozdělí do skupinek po čtyřech a každá skupina obdrží obálky s jednotlivými sloučeninami, pomocí kterých sestaví učitelem zadané rovnice reakcí; je na jeho uvážení, kolik a jakých. Cílem je, aby každá skupina sestavila zadané rovnice a byla za to náležitě odměněna (známkou, bodem …).

SEZNAM REAKCÍ

substituční deriváty

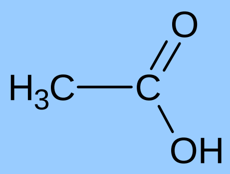
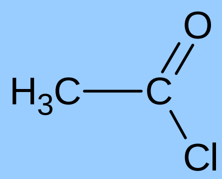
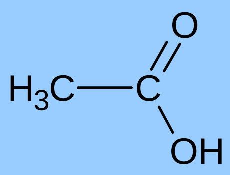
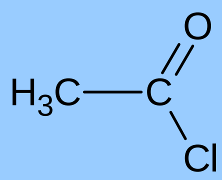
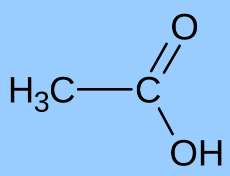
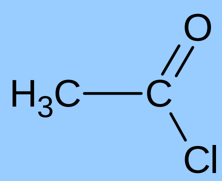
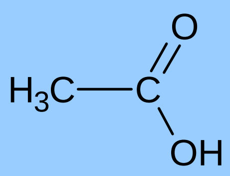
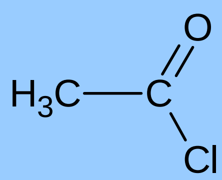
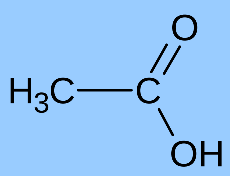
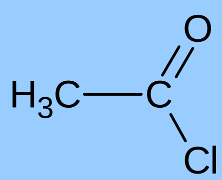
1) příprava kyseliny chloroctové
2) příprava kyseliny 2-chlopropanové
3) příprava kyseliny mléčné (2-hydroxypropanové)
4) příprava kyseliny citronové (2-hydroxypropantrikarboxylové)
5) zjednodušená syntéza kyseliny salicylové (2-hydroxybenzenkarboxylové)
6) zjednodušená syntéza kyseliny acetylsalicylové
7) zjednodušená syntéza alaninu (2-aminopropanové kyseliny)
8) zjednodušená syntéza valinu (2-amino-3-metylbutanové kyseliny)

funkční deriváty

1) příprava acetylchloridu
2) příprava benzoylchloridu
3) příprava acetanhydridu
4) příprava methylesteru z acetanhydridu
5) příprava acetamidu
6) příprava benzamidu
7) příprava acetonitrilu
8) příprava ethylacetátu
9) příprava butylbenzoátu
10) rekace butylacetátu s vodou
11) reakce methylacetátu s NaOH

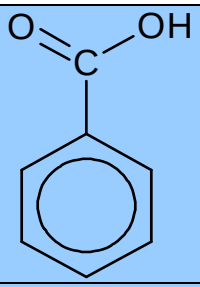
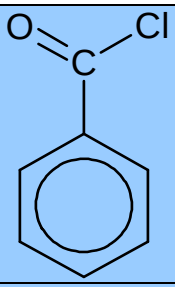
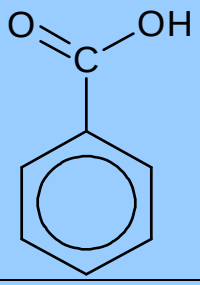
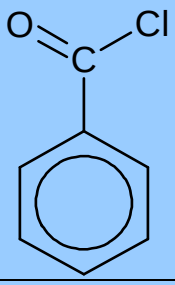
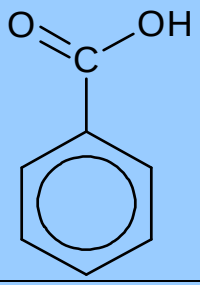
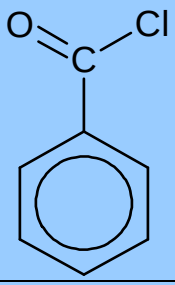
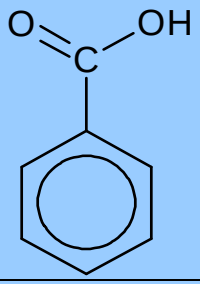
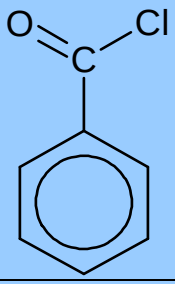
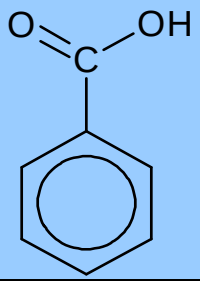
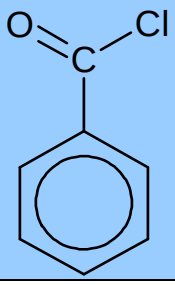
Funkční deriváty karboxylových kyselin

PŘÍPRAVA ACETYLCHLORIDU

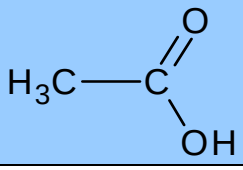
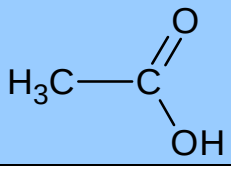
	$SOCl_2$		SO_2	HCl
	$SOCl_2$		SO_2	HCl
	$SOCl_2$		SO_2	HCl
	$SOCl_2$		SO_2	HCl
	$SOCl_2$		SO_2	HCl

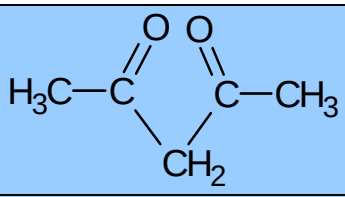
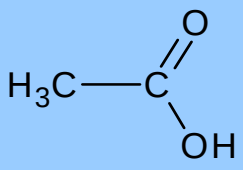
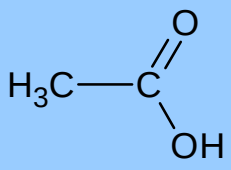
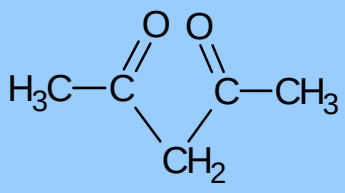
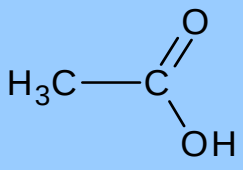
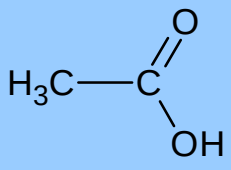
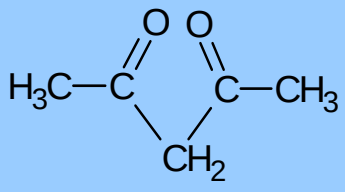
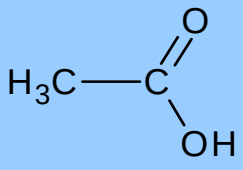
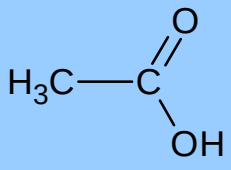
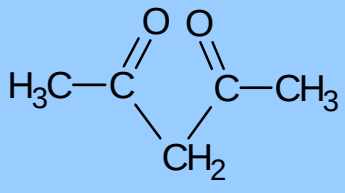
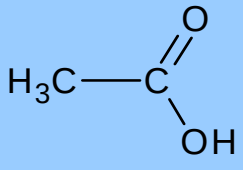
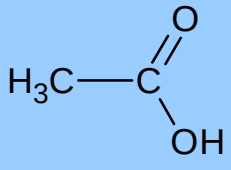
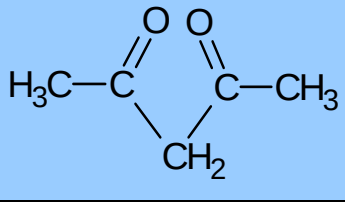
PŘÍPRAVA BENZOYLCHLORIDU

	PCl_3		P_2O_3	HCl

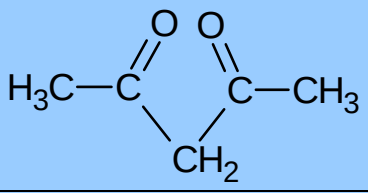
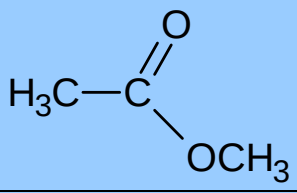
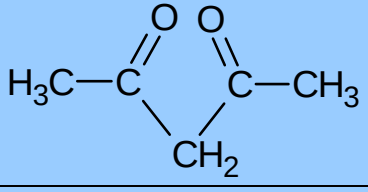
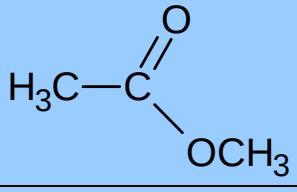
				
	**PCl_3**		**P_2O_3**	**HCl**
	**PCl_3**		**P_2O_3**	**HCl**
	**PCl_3**		**P_2O_3**	**HCl**
	**PCl_3**		**P_2O_3**	**HCl**

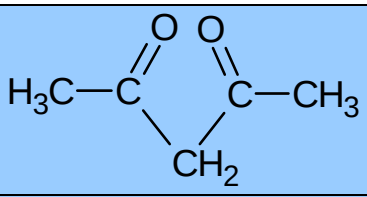
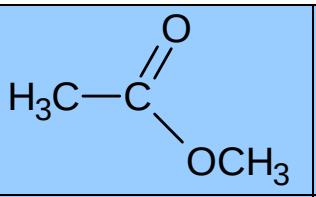
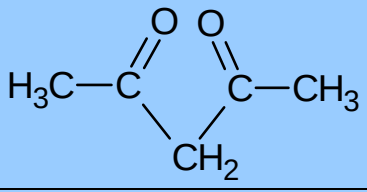
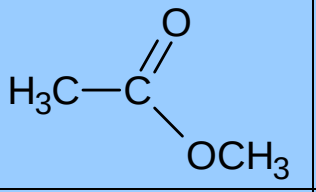
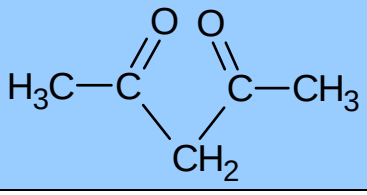
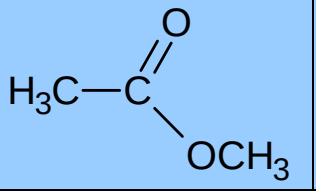
PŘÍPRAVA ACETANHYDRIDU

			**H_2O**

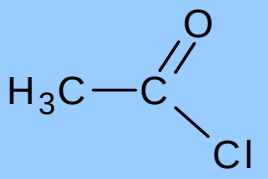
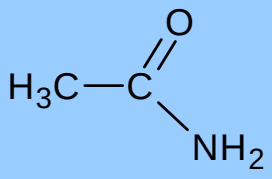
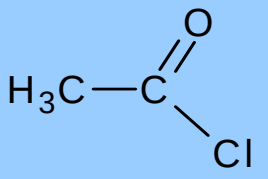
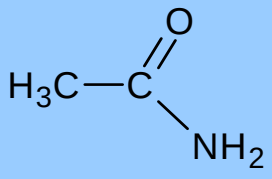
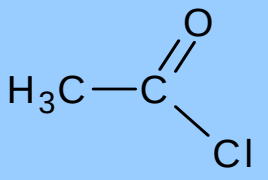
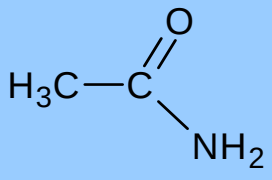
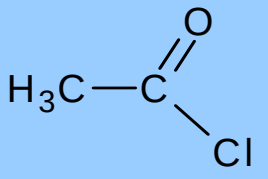
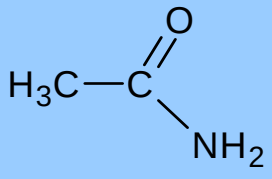
			
			**H_2O**
			**H_2O**
			**H_2O**
			**H_2O**

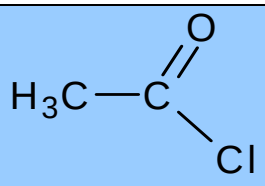
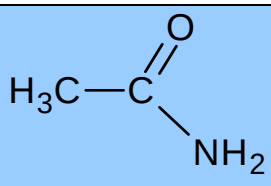
PŘÍPRAVA METHYLESTERU Z ACETANHYDRIDU

	**CH_3OH**		**HCOOH**
	**CH_3OH**		**HCOOH**

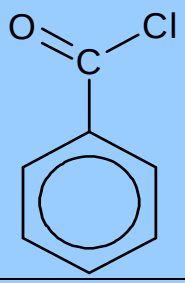
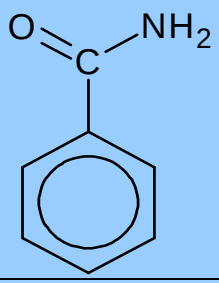
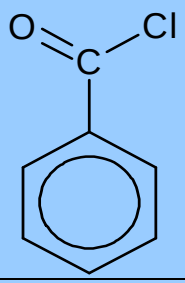
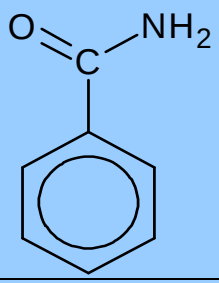
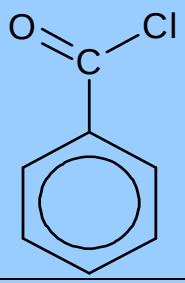
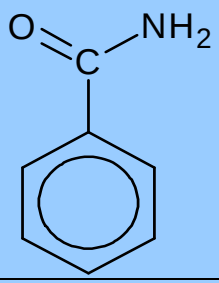
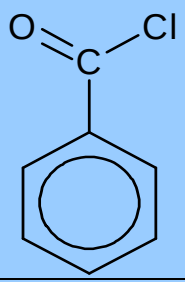
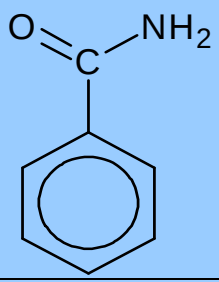
	**CH_3OH**		**HCOOH**
	**CH_3OH**		**HCOOH**
	**CH_3OH**		**HCOOH**

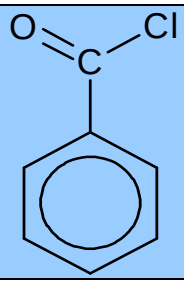
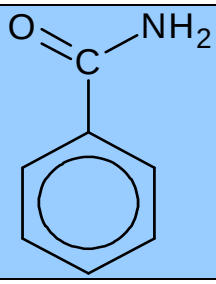
PŘÍPRAVA ACETAMIDU

	**NH_3**		**HCl**
	**NH_3**		**HCl**
	**NH_3**		**HCl**
	**NH_3**		**HCl**

	**NH_3**		**HCl**

PŘÍPRAVA BENZAMIDU

	**NH_3**		**HCl**
	**NH_3**		**HCl**
	**NH_3**		**HCl**
	**NH_3**		**HCl**

	**NH_3**		**HCl**

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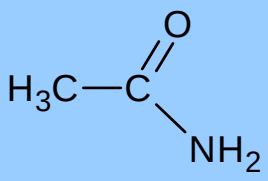
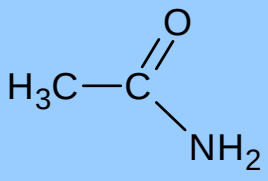
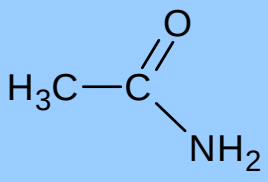
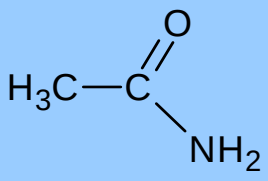
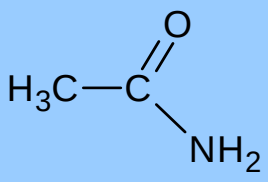
	**$CH_3 – C \equiv N$**	**H_2O**
	**$CH_3 – C \equiv N$**	**H_2O**
	**$CH_3 – C \equiv N$**	**H_2O**
	**$CH_3 – C \equiv N$**	**H_2O**
	**$CH_3 – C \equiv N$**	**H_2O**

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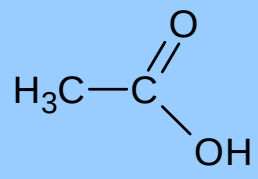
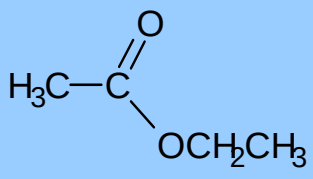
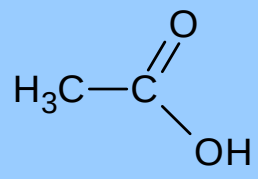
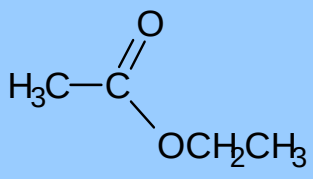
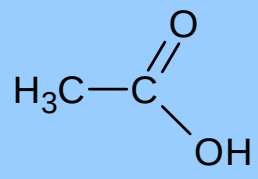
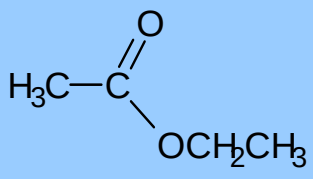
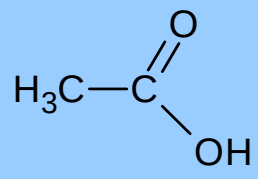
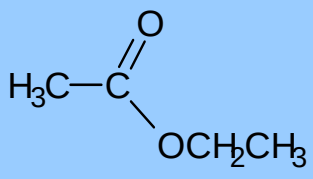
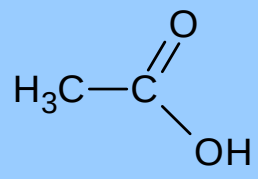
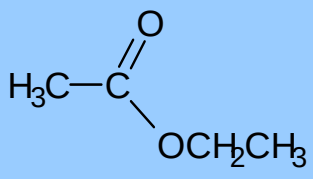
	**CH_3CH_2OH**		**H_2O**
	**CH_3CH_2OH**		**H_2O**
	**CH_3CH_2OH**		**H_2O**
	**CH_3CH_2OH**		**H_2O**
	**CH_3CH_2OH**		**H_2O**

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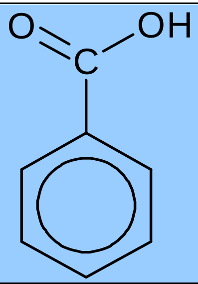
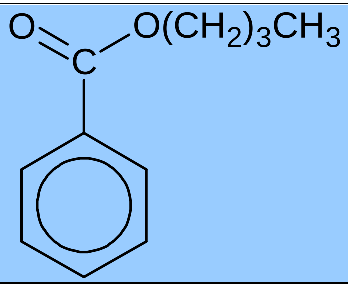
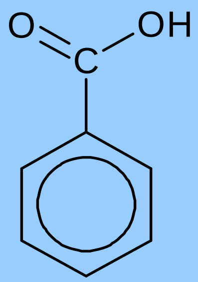
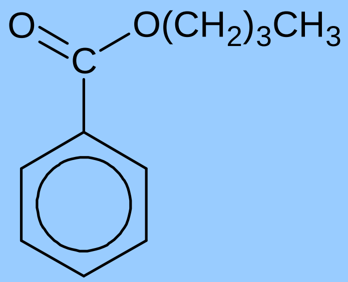
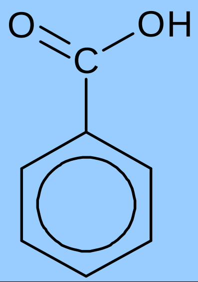
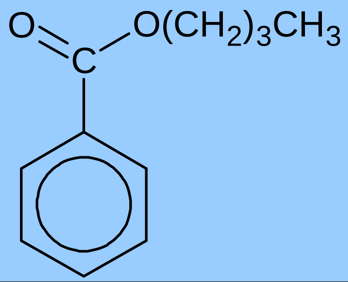
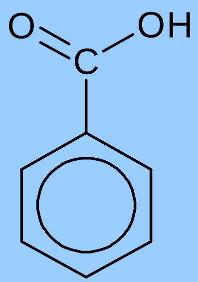
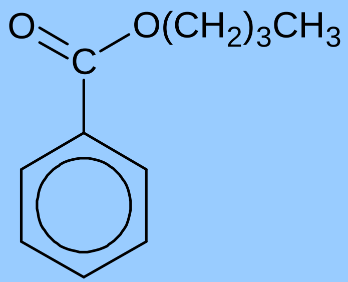
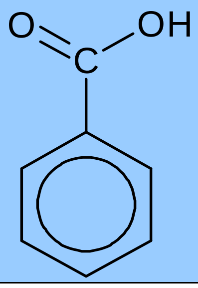
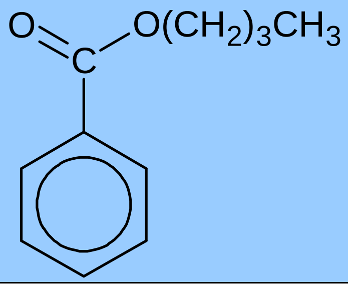
	**$CH_3(CH_2)_3OH$**		**H_2O**
	**$CH_3(CH_2)_3OH$**		**H_2O**
	**$CH_3(CH_2)_3OH$**		**H_2O**
	**$CH_3(CH_2)_3OH$**		**H_2O**
	**$CH_3(CH_2)_3OH$**		**H_2O**

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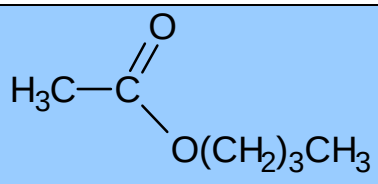
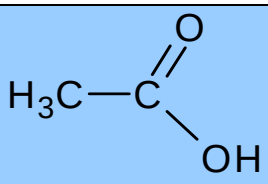
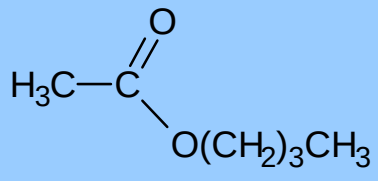
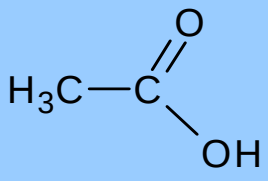
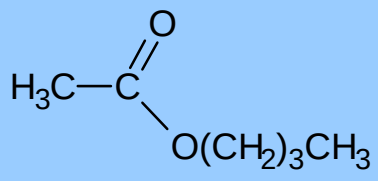
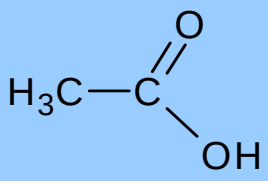
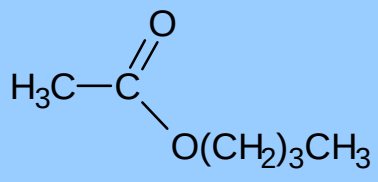
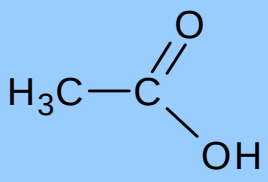
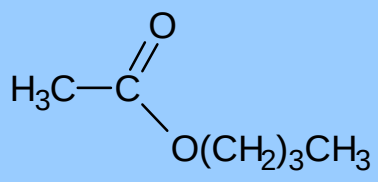
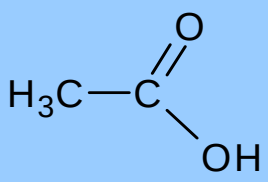
	H_2O		**$CH_3(CH_2)_3OH$**

			
	**H_2O**		**$CH_3(CH_2)_3OH$**
	**H_2O**		**$CH_3(CH_2)_3OH$**
	**H_2O**		**$CH_3(CH_2)_3OH$**
	**H_2O**		**$CH_3(CH_2)_3OH$**

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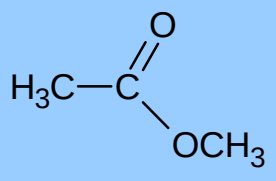
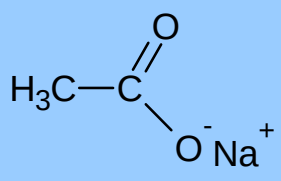
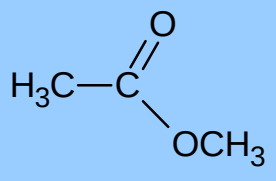
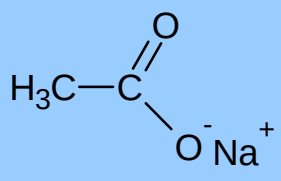
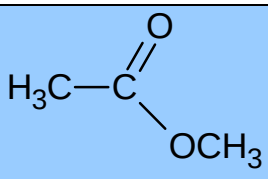
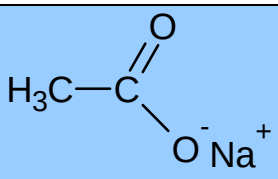
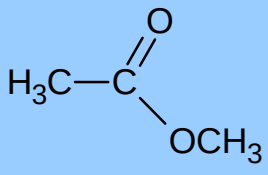
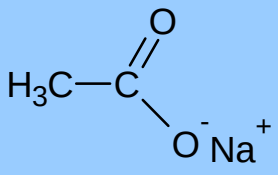
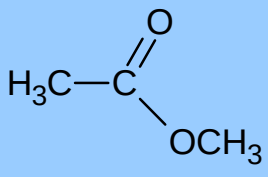
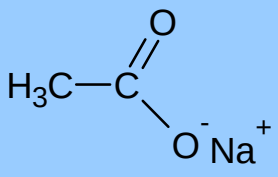
	**NaOH**	**CH_3OH**	
	**NaOH**	**CH_3OH**	

	**NaOH**	**CH_3OH**	
	**NaOH**	**CH_3OH**	
	**NaOH**	**CH_3OH**	

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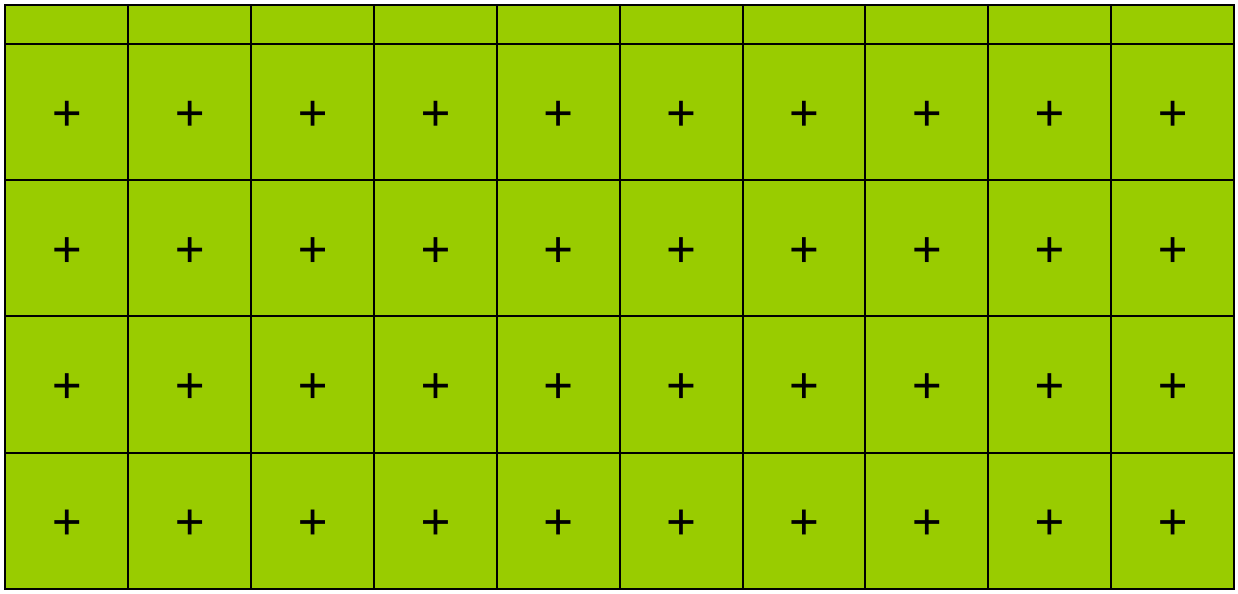

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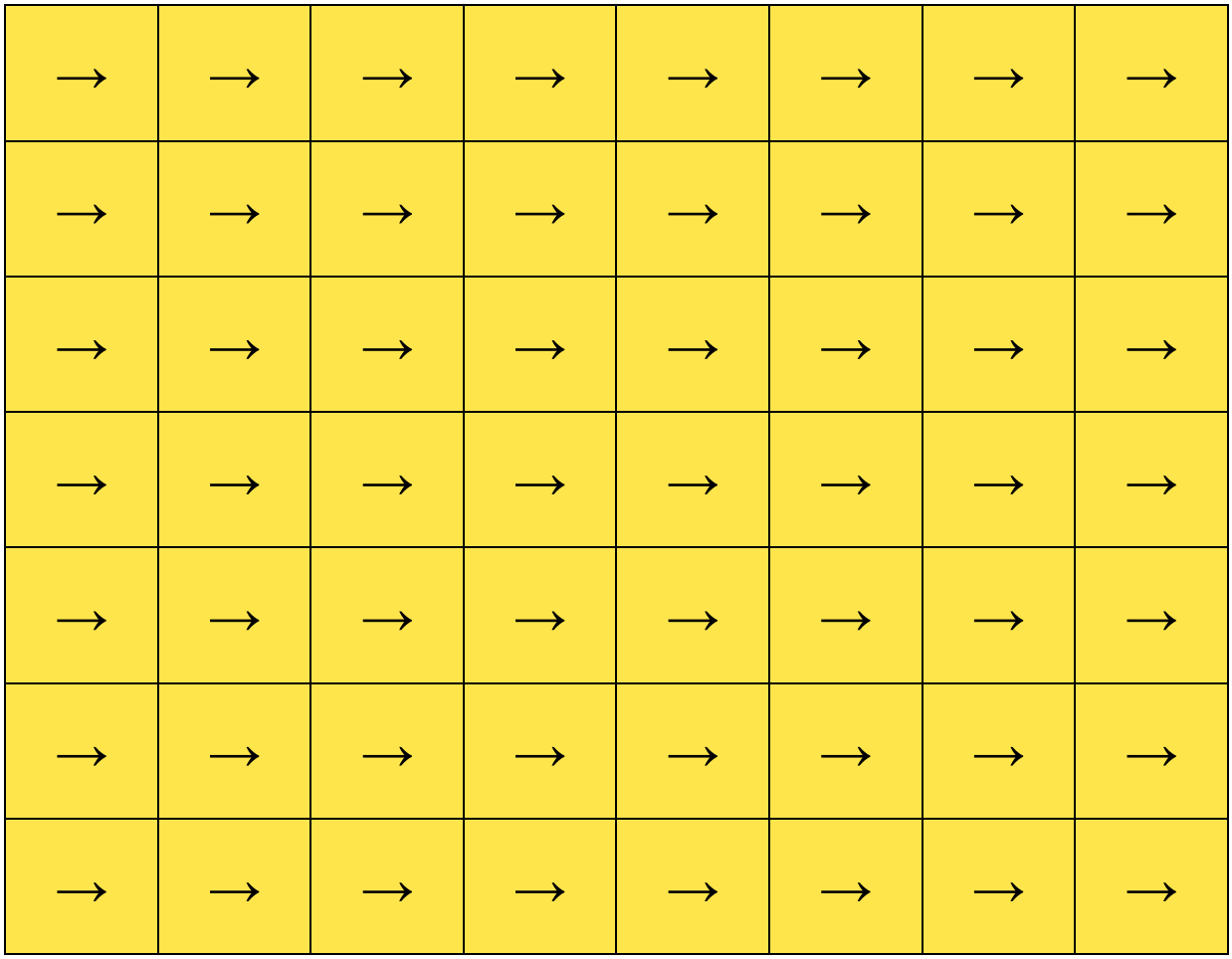


REAKČNÍ PODMÍNKY

P_2O_5	P_2O_5	P_2O_5	P_2O_5	P_2O_5
P_2O_5	P_2O_5	P_2O_5	P_2O_5	P_2O_5
H^+	H^+	H^+	H^+	H^+
H^+	H^+	H^+	H^+	H^+
H^+	H^+	H^+	H^+	H^+

Substituční deriváty

PŘÍPRAVA KYSELINY CHLOROCTOVÉ

CH_3COOH	Cl_2	$ClCH_2COOH$	HCl
CH_3COOH	Cl_2	$ClCH_2COOH$	HCl
CH_3COOH	Cl_2	$ClCH_2COOH$	HCl
CH_3COOH	Cl_2	$ClCH_2COOH$	HCl
CH_3COOH	Cl_2	$ClCH_2COOH$	HCl

PŘÍPRAVA KYSELINY 2-CHLORPROPANOVÉ

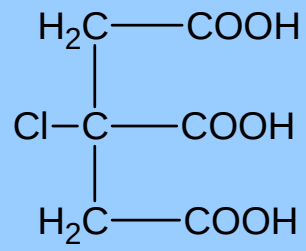
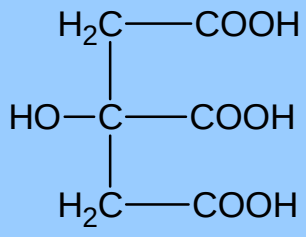
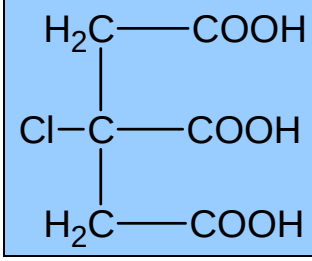
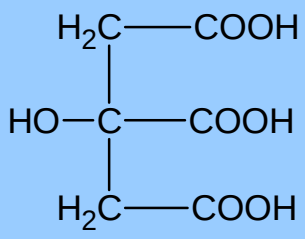
CH_3CH_2COOH	Cl_2	$CH_3CHCOOH$ Cl	HCl
CH_3CH_2COOH	Cl_2	$CH_3CHCOOH$ Cl	HCl
CH_3CH_2COOH	Cl_2	$CH_3CHCOOH$ Cl	HCl
CH_3CH_2COOH	Cl_2	$CH_3CHCOOH$ Cl	HCl

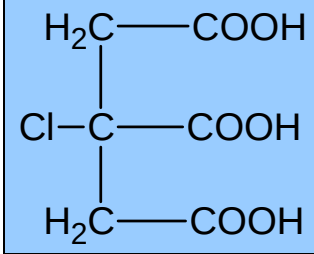
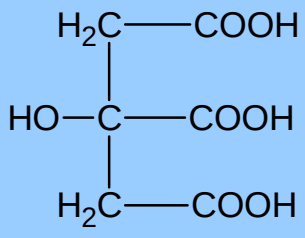
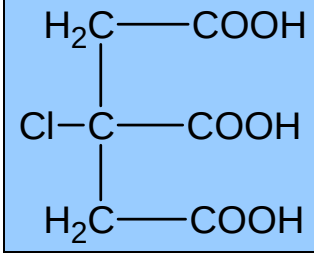
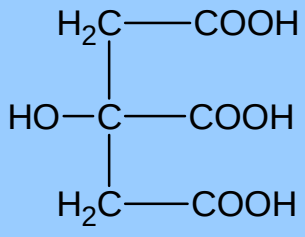
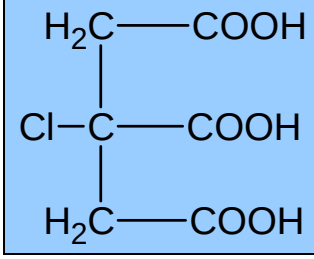
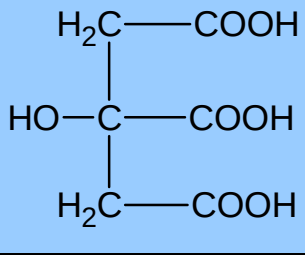
CH_3CH_2COOH	**Cl_2**	**$CH_3CHCOOH$ Cl**	**HCl**

PŘÍPRAVA KYSELINY MLÉČNÉ

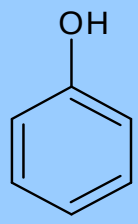
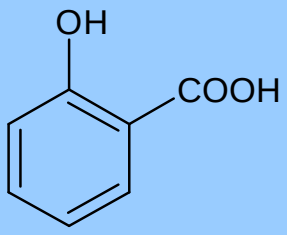
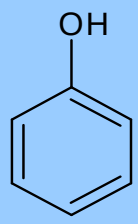
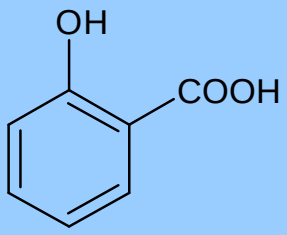
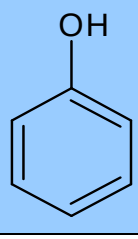
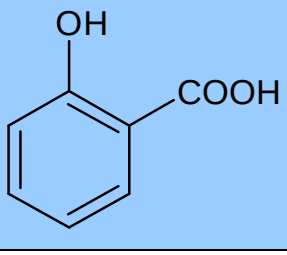
$CH_3CHCOOH$ Cl	**NaOH**	**$CH_3CHCOOH$ OH**	**NaCl**
$CH_3CHCOOH$ Cl	**NaOH**	**$CH_3CHCOOH$ OH**	**NaCl**
$CH_3CHCOOH$ Cl	**NaOH**	**$CH_3CHCOOH$ OH**	**NaCl**
$CH_3CHCOOH$ Cl	**NaOH**	**$CH_3CHCOOH$ OH**	**NaCl**
$CH_3CHCOOH$ Cl	**NaOH**	**$CH_3CHCOOH$ OH**	**NaCl**

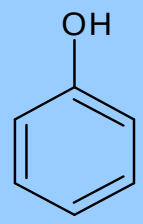
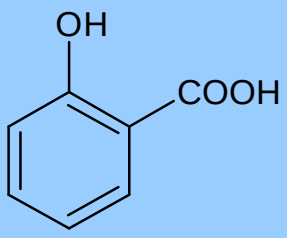
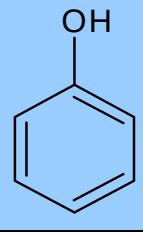
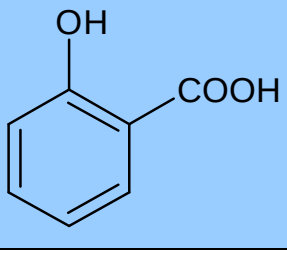
PŘÍPRAVA KYSELINY CITRONOVÉ

	**NaOH**		**NaCl**
	**NaOH**		**NaCl**

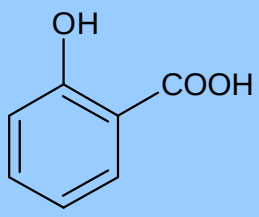
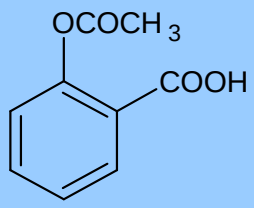
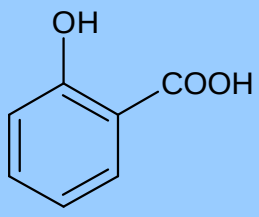
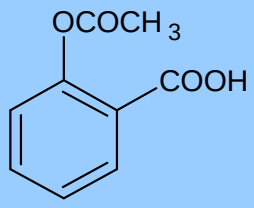
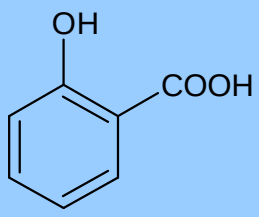
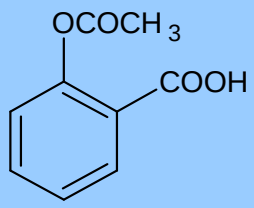
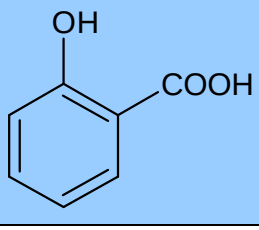
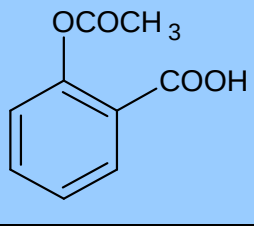
	**NaOH**		**NaCl**
	**NaOH**		**NaCl**
	**NaOH**		**NaCl**

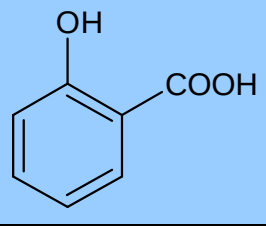
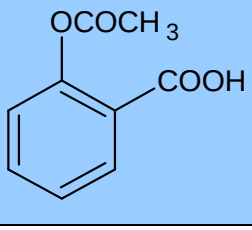
SYNTÉZA KYSELINY SALICYLOVÉ

	**CO_2**	
	**CO_2**	
	**CO_2**	

	**CO_2**	
	**CO_2**	

SYNTÉZA KYSELINY ACETYLSALICYLOVÉ

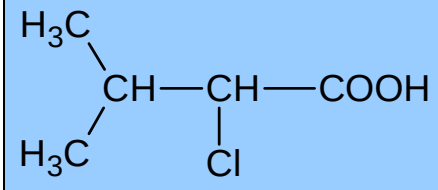
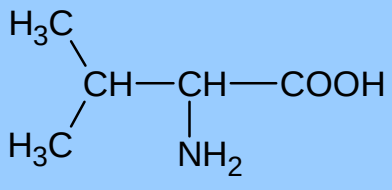
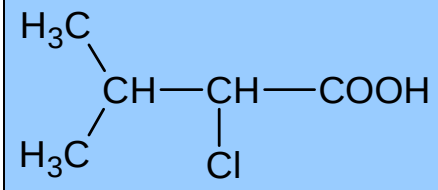
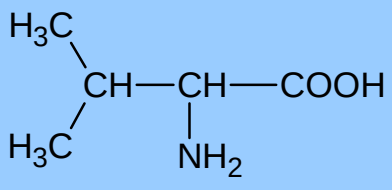
	**$(CH_3O)_2O$**		**CH_3COOH**
	**$(CH_3O)_2O$**		**CH_3COOH**
	**$(CH_3O)_2O$**		**CH_3COOH**
	**$(CH_3O)_2O$**		**CH_3COOH**

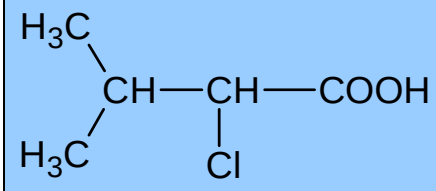
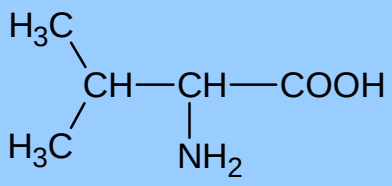
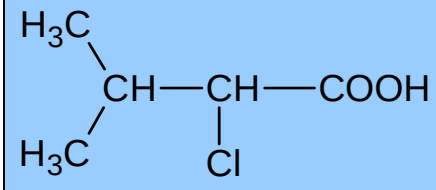
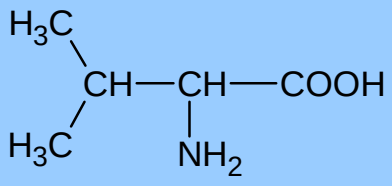
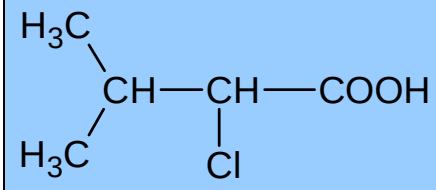
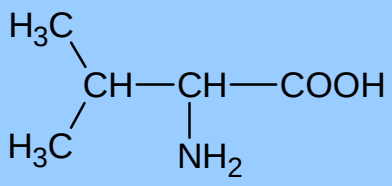
	**$(CH_3O)_2O$**		**CH_3COOH**

SYNTÉZA ALANINU

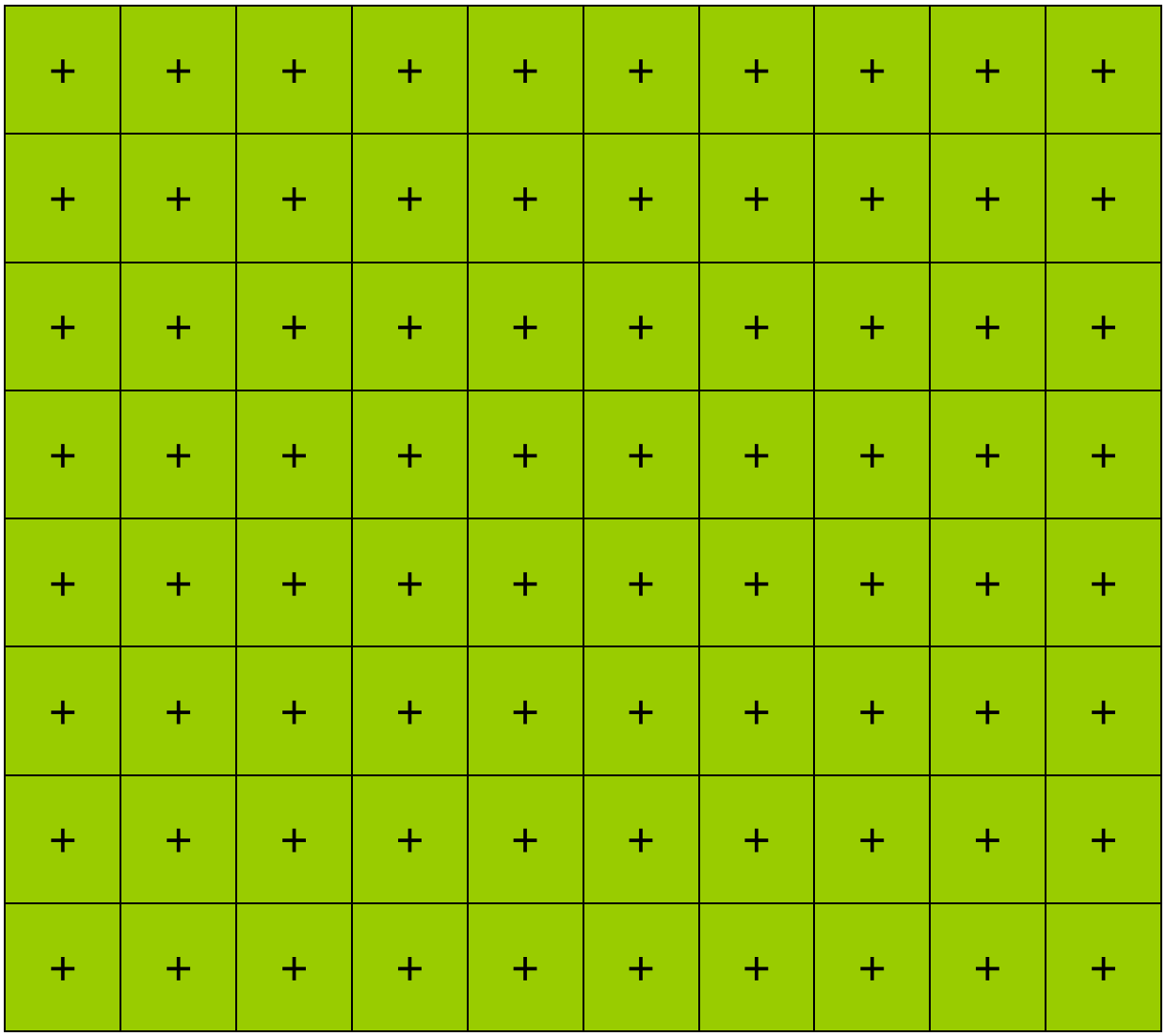
$CH_3CHCOOH$ Cl	**NH_3**	**$CH_3CHCOOH$ NH_2**	**HCl**
$CH_3CHCOOH$ Cl	**NH_3**	**$CH_3CHCOOH$ NH_2**	**HCl**
$CH_3CHCOOH$ Cl	**NH_3**	**$CH_3CHCOOH$ NH_2**	**HCl**
$CH_3CHCOOH$ Cl	**NH_3**	**$CH_3CHCOOH$ NH_2**	**HCl**
$CH_3CHCOOH$ Cl	**NH_3**	**$CH_3CHCOOH$ NH_2**	**HCl**

SYNTÉZA VALINU

	**NH_3**		**HCl**
	**NH_3**		**HCl**

	**NH_3**		**HCl**
	**NH_3**		**HCl**
	**NH_3**		**HCl**

PLUSKA



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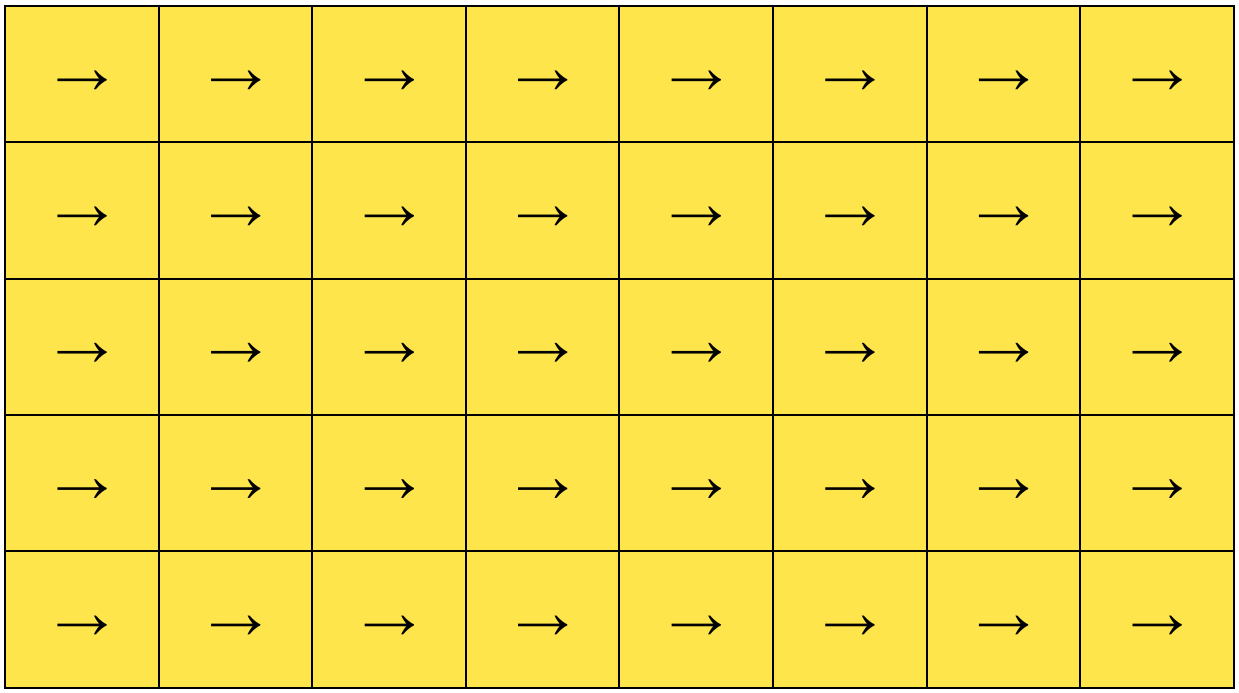

REAKČNÍ PODMÍNKY

Δ	Δ	Δ	Δ	Δ
Δ	Δ	Δ	Δ	Δ
DMF	**DMF**	**DMF**	**DMF**	**DMF**
DMF	**DMF**	**DMF**	**DMF**	**DMF**
NaOH	**NaOH**	**NaOH**	**NaOH**	**NaOH**