

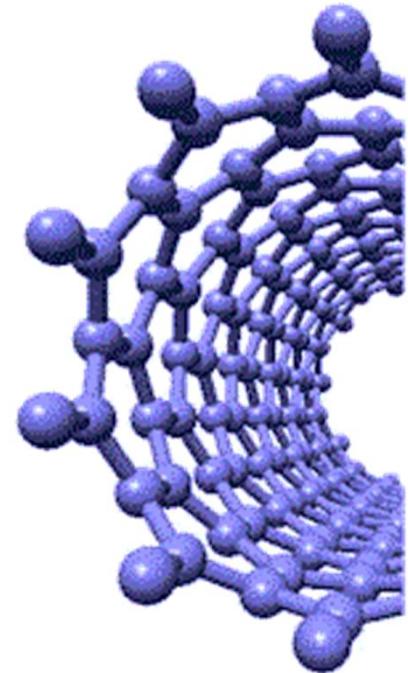


INVESTMENTS IN EDUCATION DEVELOPMENT

Innovation and Development of Study Field Nanomaterials at the Technical University of Liberec

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These materials have been developed within the ESF project: Innovation and development of study field Nanomaterials at the Technical University of Liberec



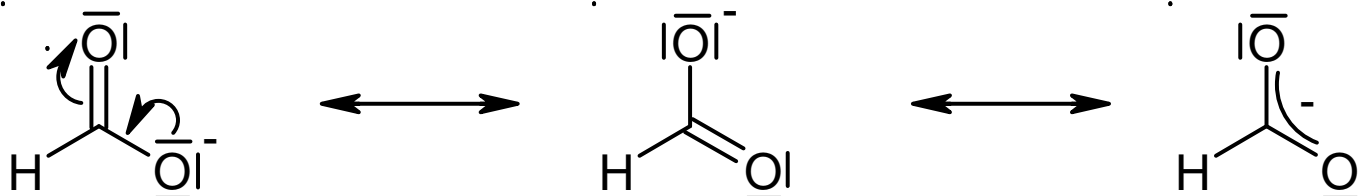
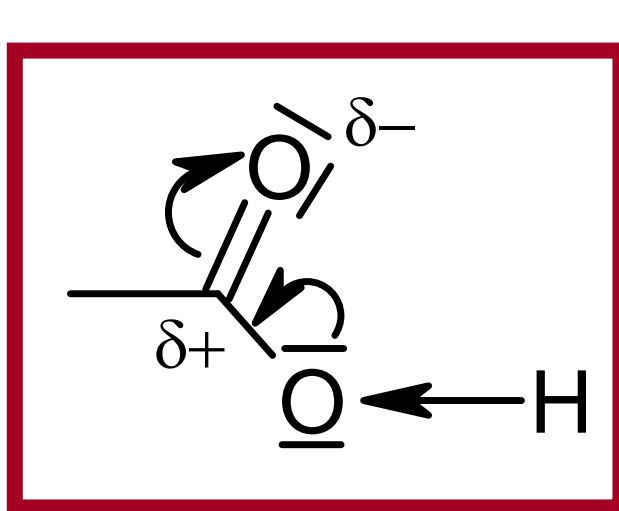
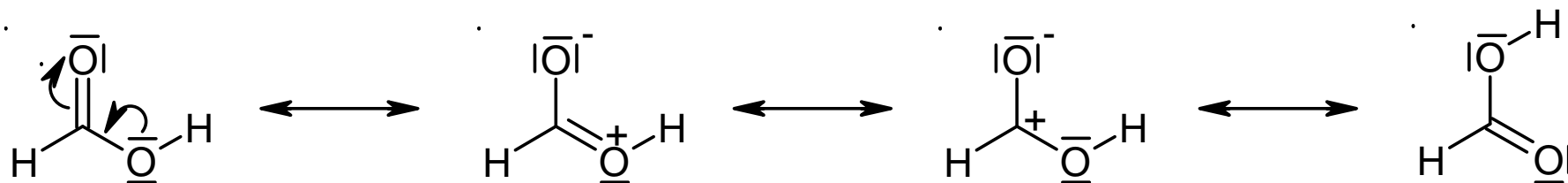
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Organic Chemistry I – Chapter 12

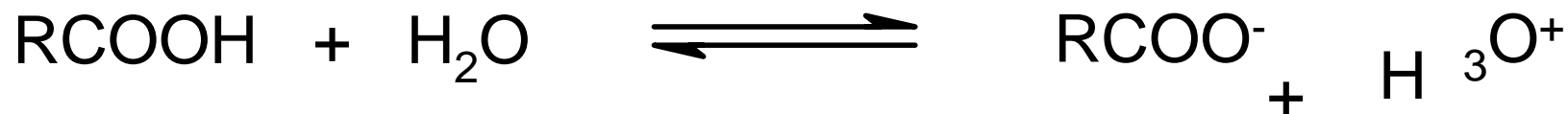


Carboxylic acid and derivatives





Carboxylic acid acidity



$$K = \frac{[\text{RCOO}^-] \cdot [\text{H}_3\text{O}^+]}{[\text{RCOOH}] \cdot [\text{H}_2\text{O}]}$$

$$K_a = \frac{[\text{RCOO}^-] \cdot [\text{H}_3\text{O}^+]}{[\text{RCOOH}]}$$

$$\text{p}K_a = -\log K_a$$

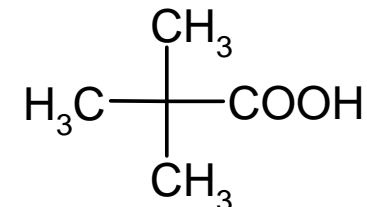
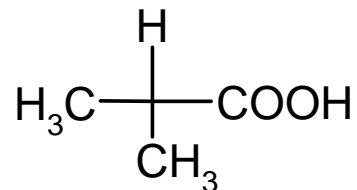
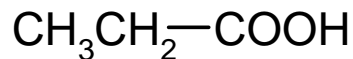
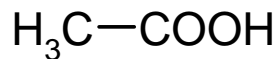
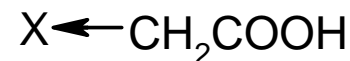
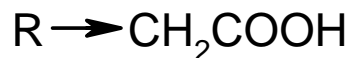




Organic Chemistry – functional groups



Carboxylic acid acidity

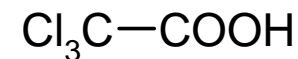
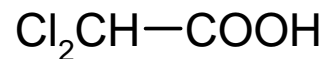
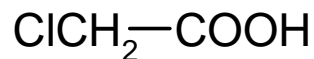


pK_a 4,76

4,88

4,90

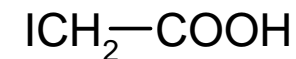
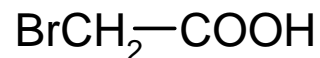
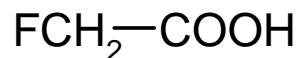
5,02



2,81

1,29

0,64



2,66

2,87

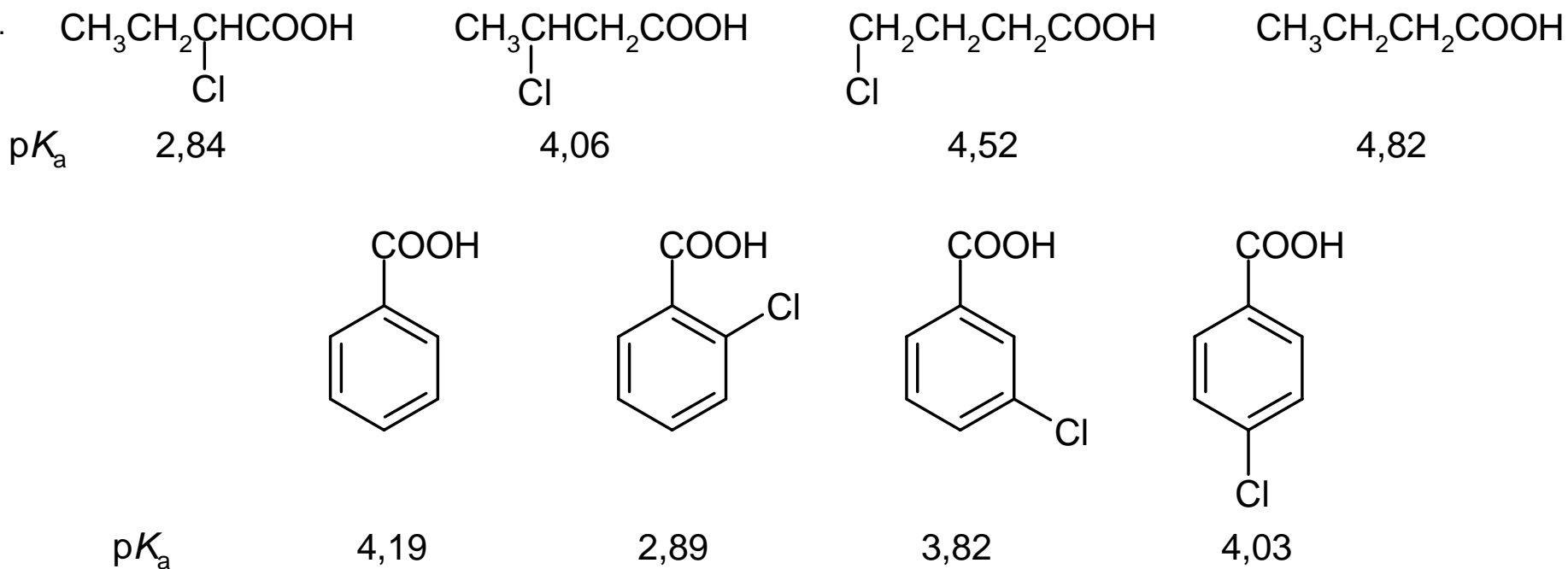
3,13



Organic Chemistry – functional groups



Carboxylic acid acidity



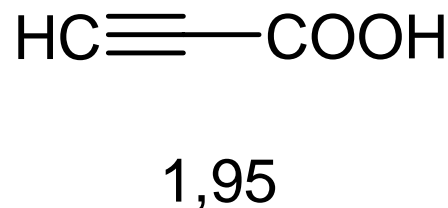
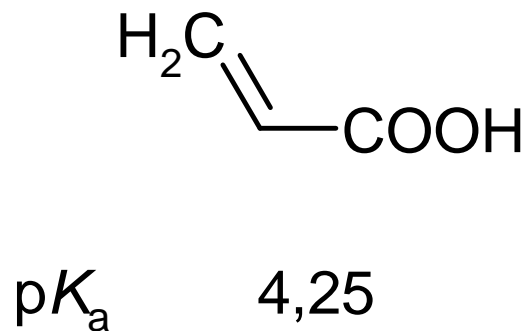


Organic Chemistry – functional groups



Carboxylic acid acidity

	HOOC—COOH	HOOCCH ₂ COOH	HOOCCH ₂ CH ₂ COOH
pK_{a1}	1,27	2,85	4,19
pK_{a2}	4,28	5,70	5,64

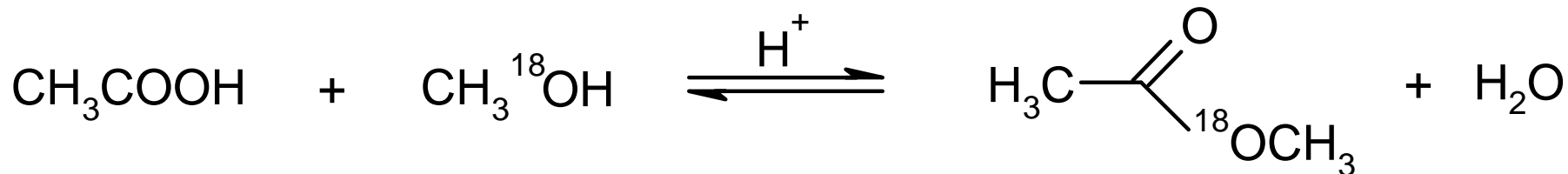
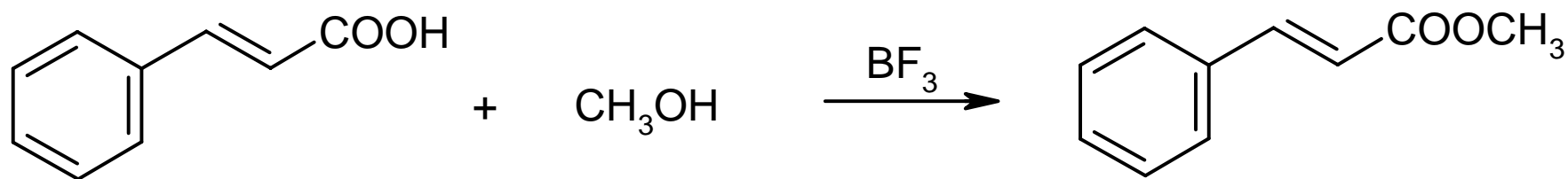
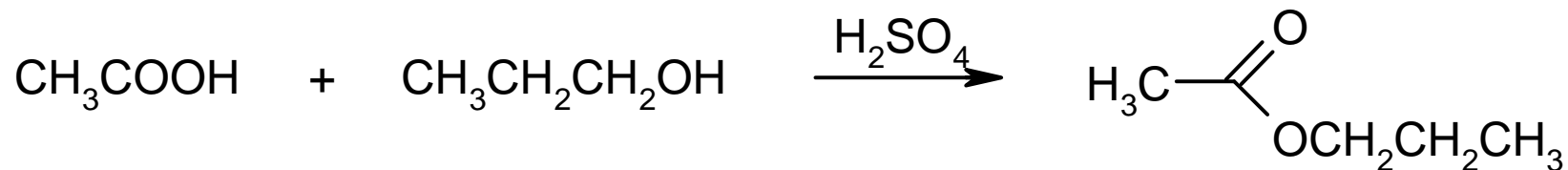




Organic Chemistry – functional groups



Carboxylic acid esterification - hydrolysis



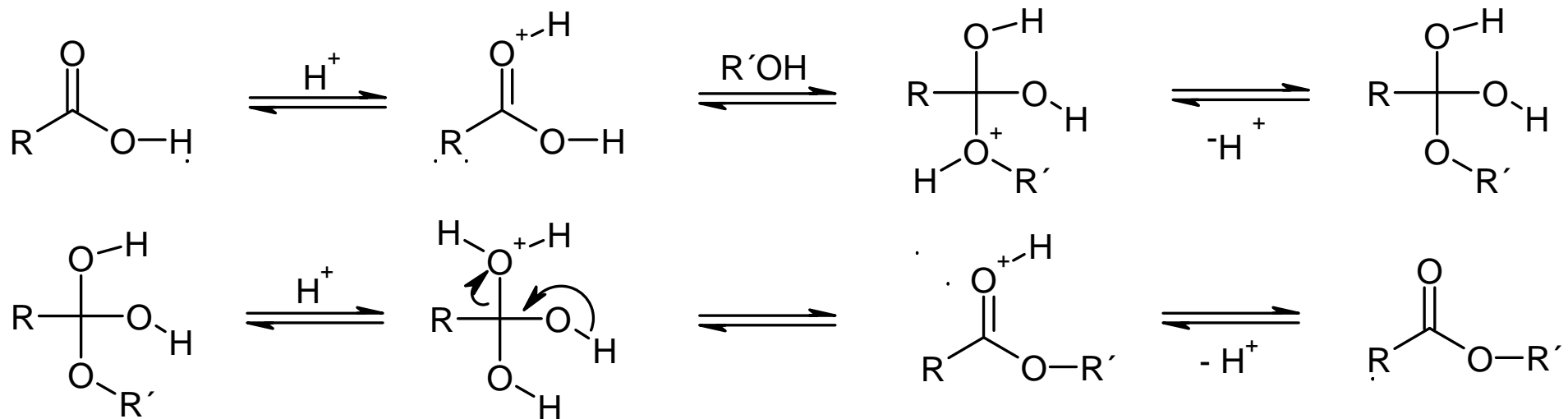


Organic Chemistry – functional groups



Carboxylic acid esterification – hydrolysis - mechanism

Esterification →



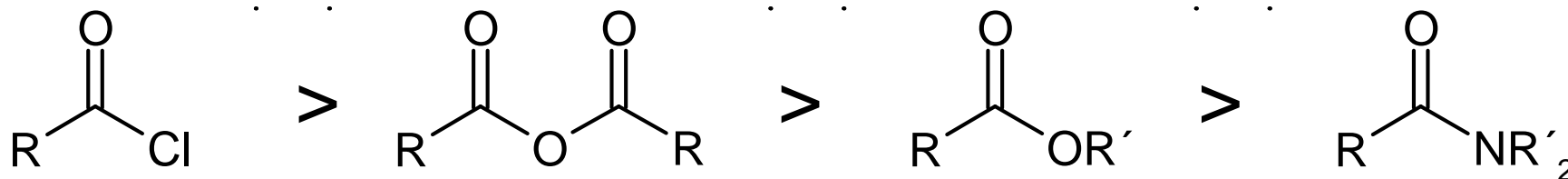
← Hydrolysis



Organic Chemistry I – Chapter 12



Carboxylic acid and derivatives - reactivity



acylhalogenide

anhydride

ester

