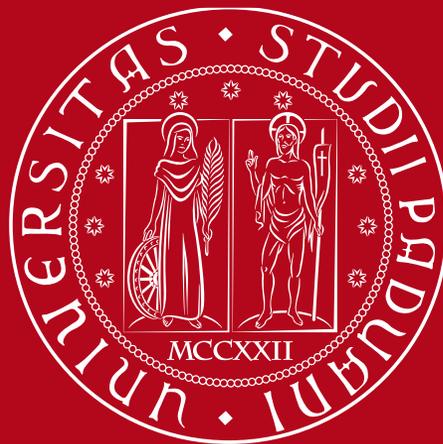


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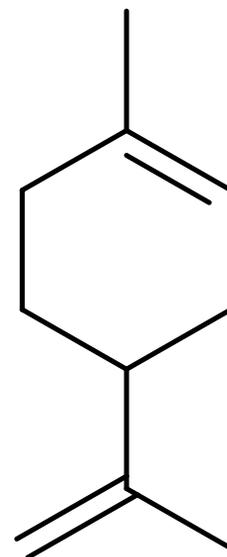
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DI PADOVA

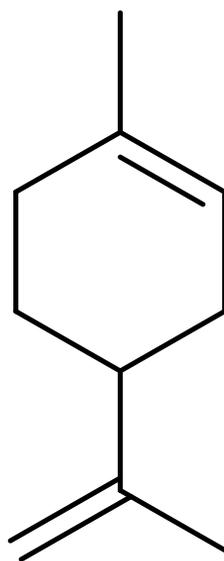
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CHIMICA ORGANICA E BIO-ORGANICA

MATRICOLA PARI

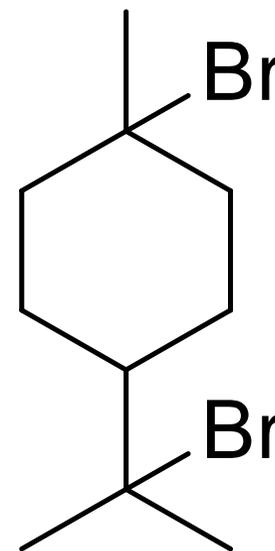
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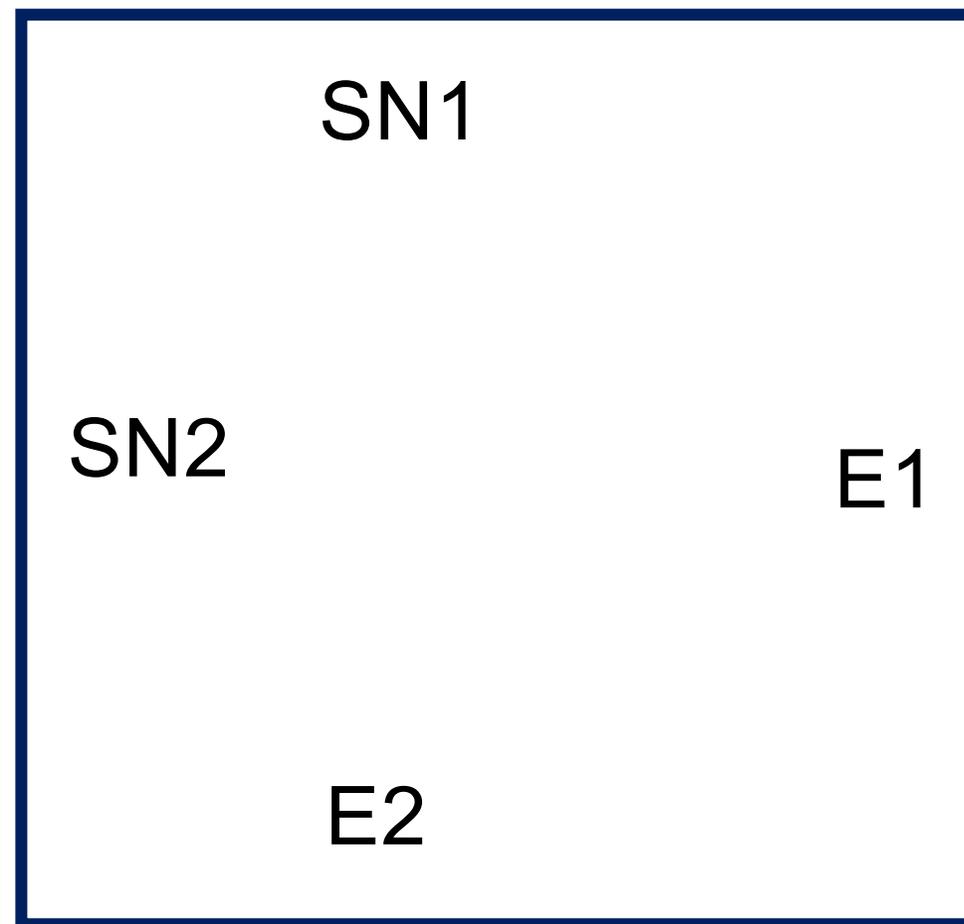
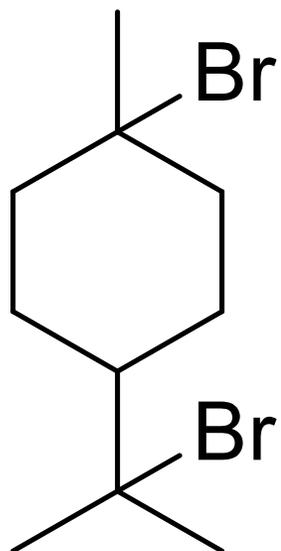
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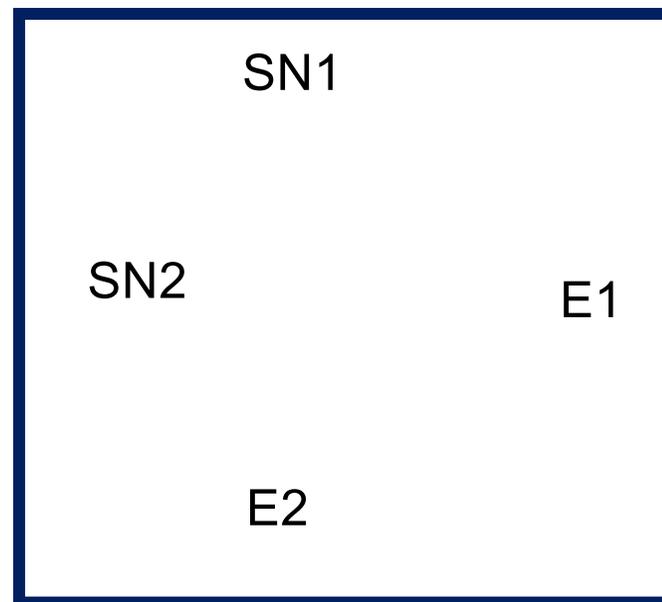
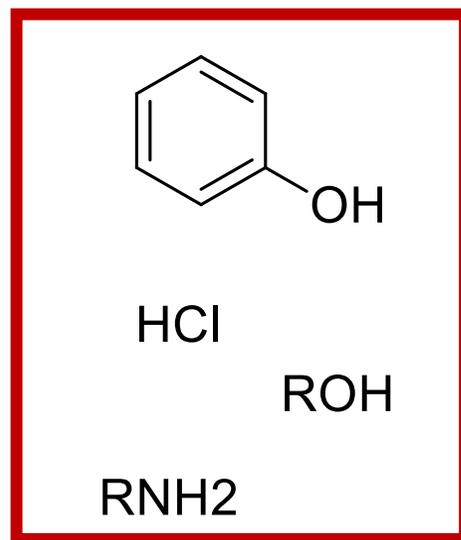
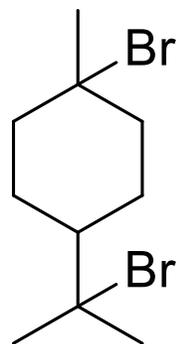


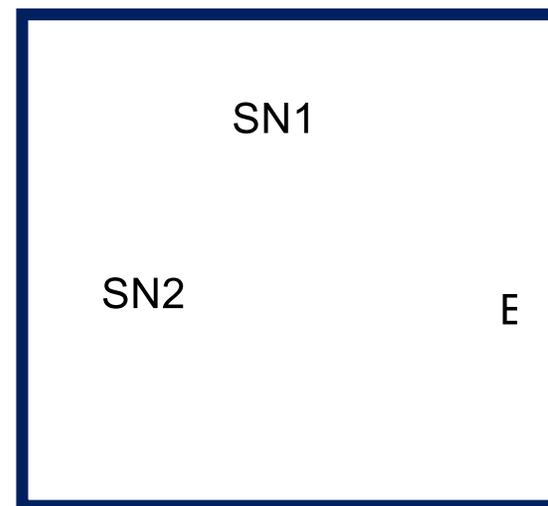
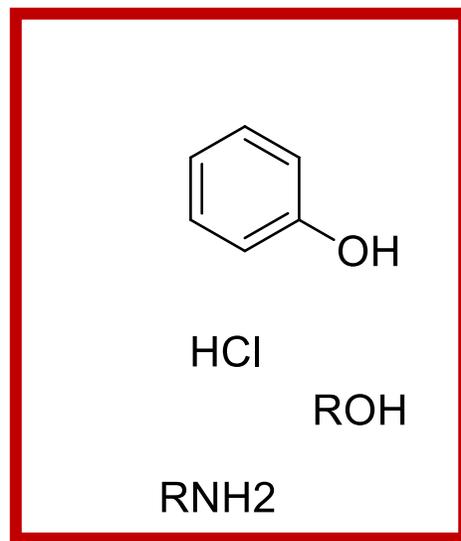
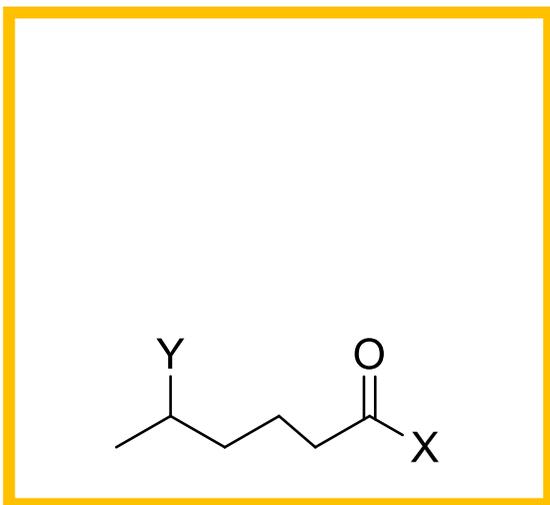


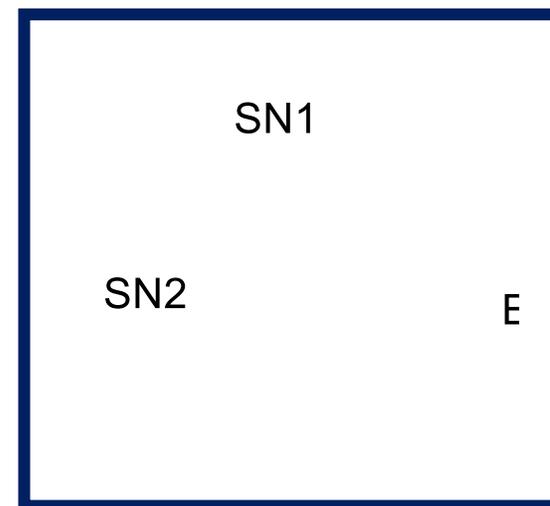
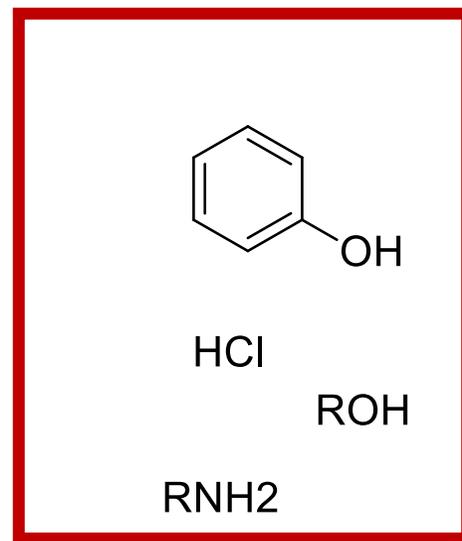
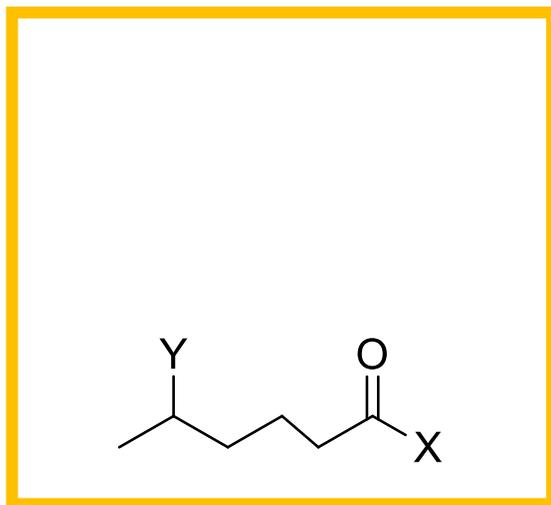
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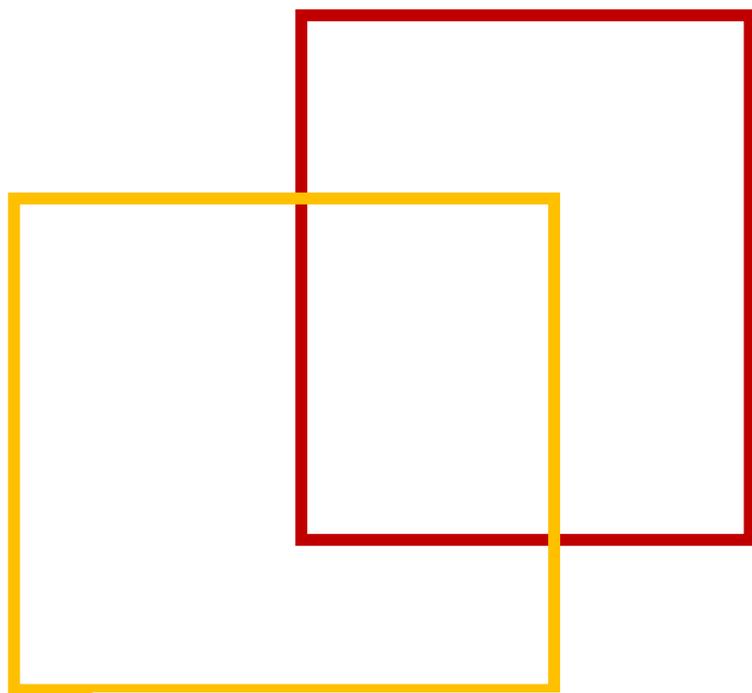




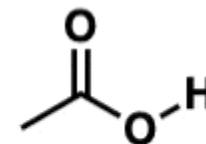
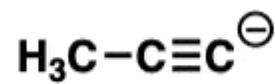
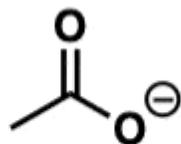
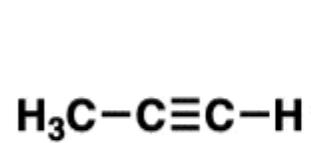








**pKa**



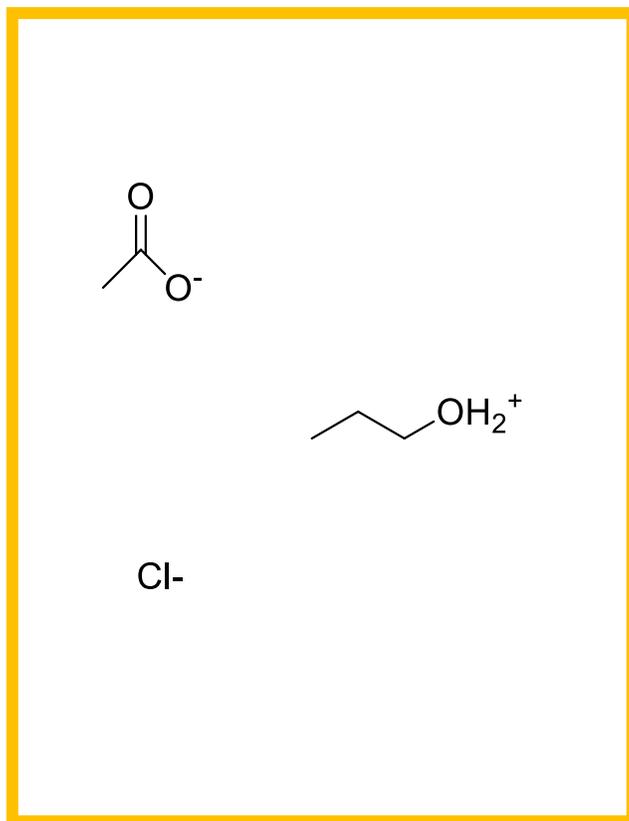
$\text{pK}_a = 25$

$\text{pK}_a = 4$

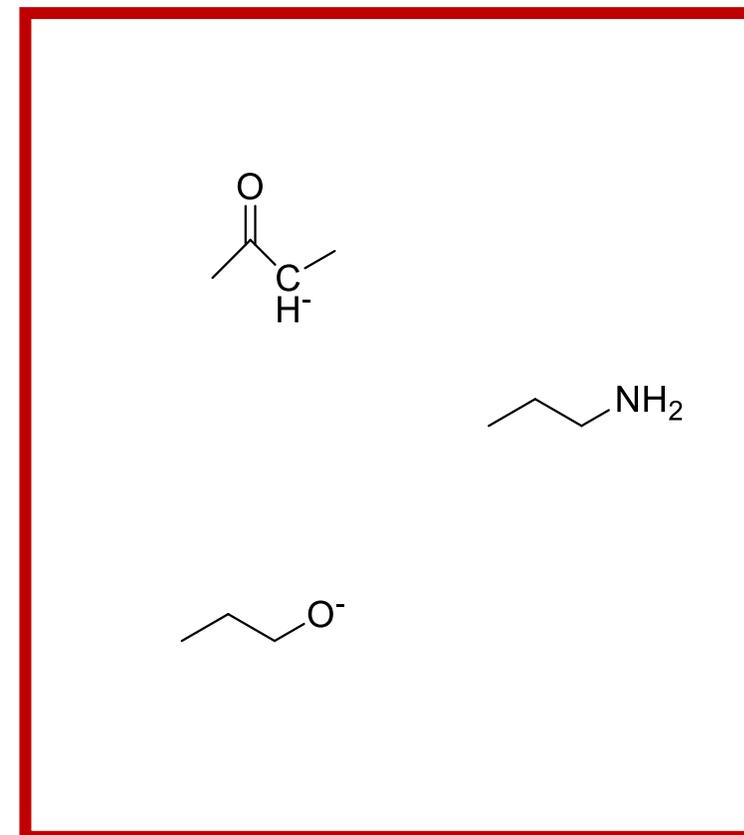
Functional group	Example	pKa	Conjugate Base
Hydroiodic acid	$\text{H}-\ddot{\text{I}}:$	-10	$:\ddot{\text{I}}:^{\ominus}$
Hydrobromic acid	$\text{H}-\ddot{\text{Br}}:$	-9	$:\ddot{\text{Br}}:^{\ominus}$
Hydrochloric acid	$\text{H}-\ddot{\text{Cl}}:$	-6	$:\ddot{\text{Cl}}:^{\ominus}$
Sulfuric acid	$\text{HO}-\text{S}(=\text{O})_2-\text{OH}$	-3	$\text{HO}-\text{S}(=\text{O})_2-\text{O}^{\ominus}$
Hydronium ion	$\text{H}_2\text{O}^{\oplus}-\text{H}$	-1.7	$\text{H}_2\text{O}:$
Sulfonic acids	$\text{H}_3\text{C}-\text{C}_6\text{H}_4-\text{SO}_3\text{H}$ (tosic acid)	-1	$\text{H}_3\text{C}-\text{C}_6\text{H}_4-\text{SO}_3^{\ominus}$
Hydrofluoric acid	$\text{H}-\ddot{\text{F}}:$	3.2	$:\ddot{\text{F}}:^{\ominus}$
Carboxylic acids	$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{OH}$	4	$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{O}^{\ominus}$
Protonated amines	$\text{H}-\text{NH}_3^{\oplus} \text{Cl}^{\ominus}$	9-11	$:\text{NH}_3$
Thiols	$\text{CH}_3-\ddot{\text{S}}-\text{H}$	13	$\text{CH}_3-\ddot{\text{S}}:^{\ominus}$

Malonates	$\text{H}_3\text{C}-\text{O}-\text{C}(=\text{O})-\text{CH}_2-\text{C}(=\text{O})-\text{O}-\text{CH}_3$	13	$\text{H}_3\text{C}-\text{O}-\text{C}(=\text{O})-\text{CH}^{\ominus}-\text{C}(=\text{O})-\text{O}-\text{CH}_3$
Water	$\text{H}-\ddot{\text{O}}-\text{H}$	14	$:\ddot{\text{O}}:^{\ominus}$
Alcohol	$\text{H}_3\text{C}-\ddot{\text{O}}-\text{H}$	17	$\text{H}_3\text{C}-\ddot{\text{O}}:^{\ominus}$
Ketone/ aldehyde	$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{H}$	20-24	$\text{H}_3\text{C}-\text{C}(=\text{O})-\text{CH}_2^{\ominus}$
Nitrile	$\text{H}-\text{C}(\text{H})-\text{C}\equiv\text{N}$	25	$\text{H}_2\text{C}^{\ominus}-\text{C}\equiv\text{N}$
Ester	$\text{H}_3\text{C}-\text{O}-\text{C}(=\text{O})-\text{H}$	25	$\text{H}_3\text{C}-\text{O}-\text{C}(=\text{O})-\text{CH}_2^{\ominus}$
Alkyne	$\text{R}-\text{C}\equiv\text{C}-\text{H}$	25	$\text{R}-\text{C}\equiv\text{C}:^{\ominus}$
Sulfoxide	$\text{H}_3\text{C}-\text{S}(=\text{O})-\text{H}$	31	$\text{H}_3\text{C}-\text{S}(=\text{O})-\text{CH}_2^{\ominus}$
Amine	$\text{H}_2\text{N}-\text{H}$	~35	$:\text{NH}_2^{\ominus}$
Hydrogen	$\text{H}-\text{H}$	36	$\text{H}^{\ominus}$
Alkene	$\text{H}_2\text{C}=\text{CH}_2$	~43	$\text{H}_2\text{C}^{\ominus}=\text{CH}_2$
Alkane	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_3$	~50	$\text{H}_3\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2^{\ominus}$

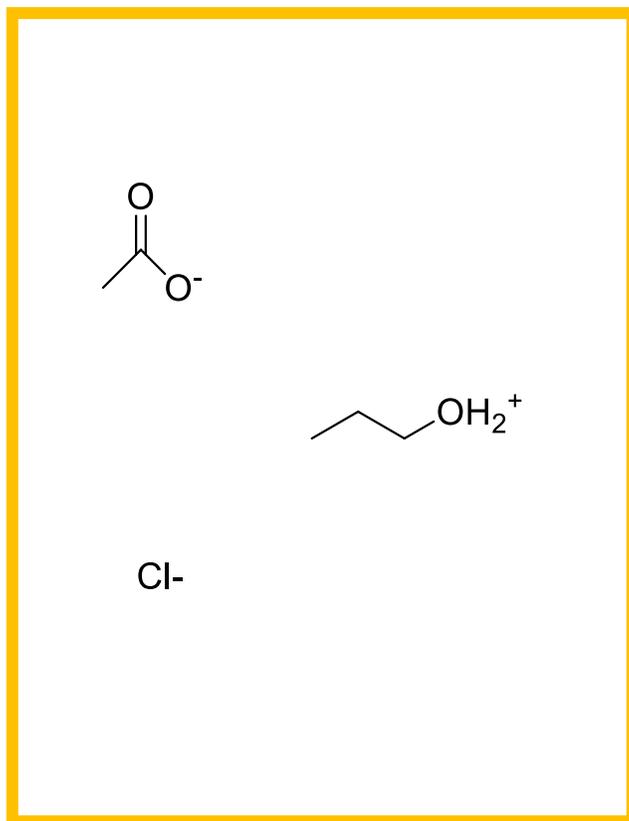
## pKa bassa



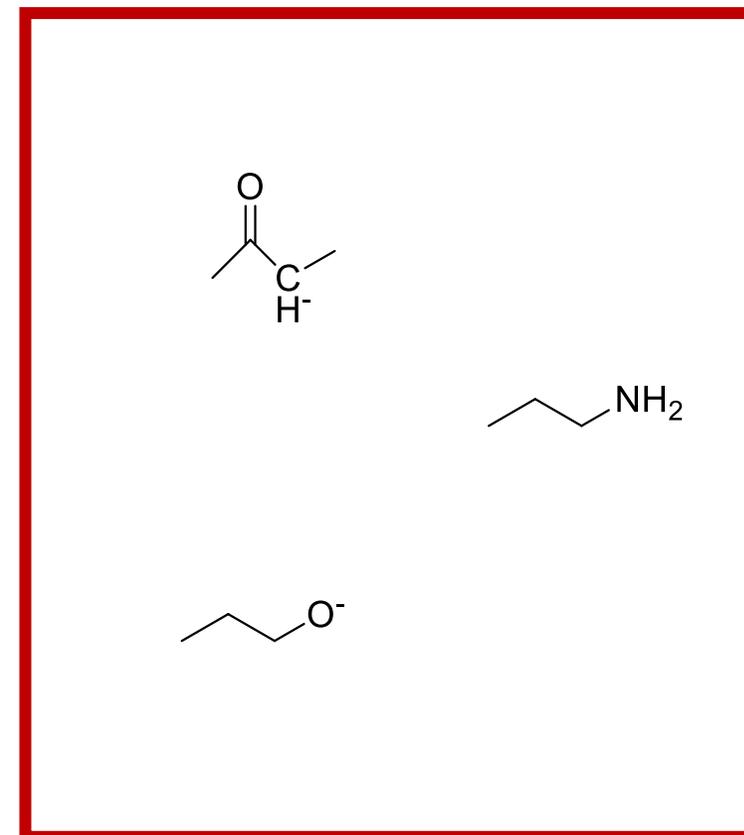
## pKa alta



## pKa bassa

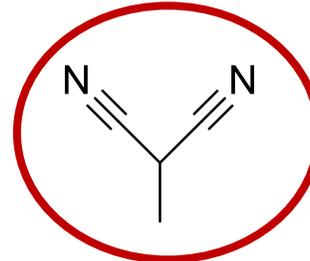
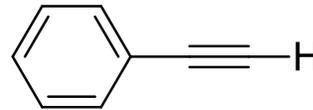
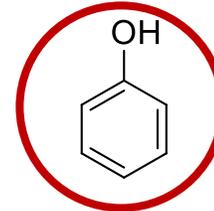
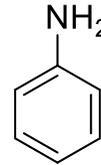
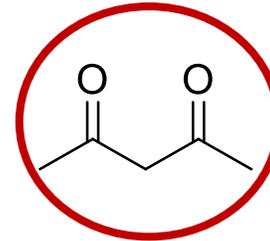
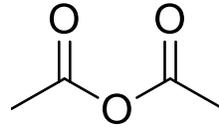
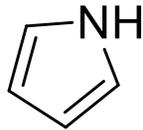
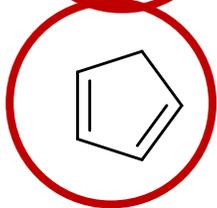
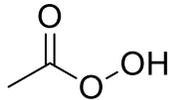
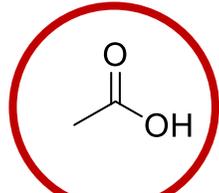
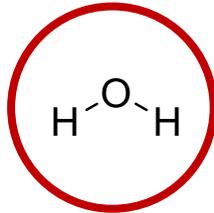
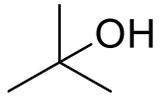


## pKa alta

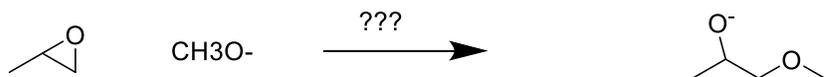
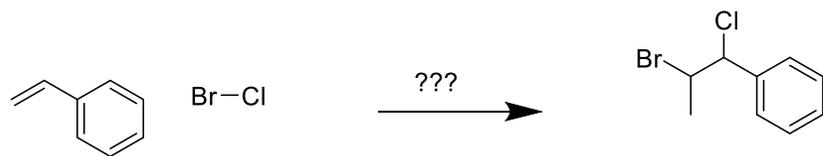
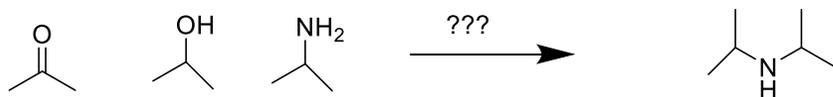
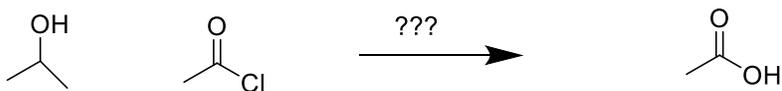
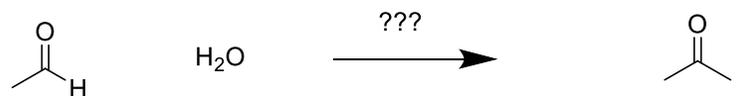
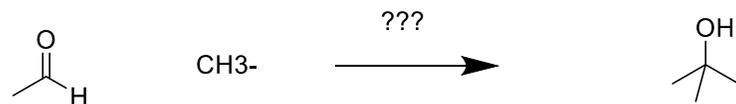


**Esercizio 1**

Indicare per ogni coppia di molecole quale è l'acido più forte (indicando sempre il protone più acido)

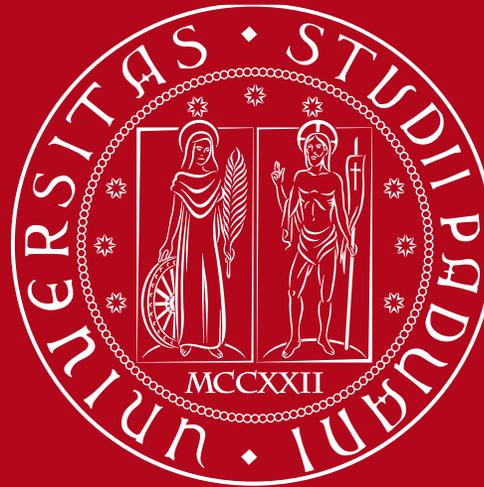


Svolto in aula



**Esercizi aggiuntivi**

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