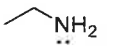
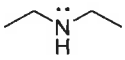
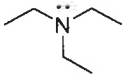
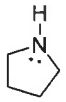
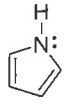
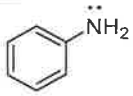
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Acid/Base Strength of Amines and Heterocycles

Notes: Amines with a lone pair are both Lewis basic and nucleophilic. Looking at the pKa of the conjugate acid can quantify the strength of the base (basicity).

- The **larger pKa** of the *conjugate acid*, the weaker the acid = **stronger conjugate base**
- **Smaller pKa** of *conjugate acid* (stronger acid) = **weaker conjugate base**

Aliphatic: non-aromatic compound **Heterocycle**: a ring containing an atom other than carbon

	Amine	Classification	pK_a of conjugate acid	Reason/Notes
	NH_3		9.26	
aliphatic amines	$H_3C-\ddot{N}H_2$	1°	10.64	
		1°	10.75	The more carbons on an alkylamine, the stronger the base through **induction.**
		2°	10.95	
	 triethylamine (Et_3N)	3°	10.75	The sterics of the three ethyl groups around the lone pair make the amine a weaker base
heterocyclic amines	 pyrrolidine	2°	11.27	Aliphatic heterocyclic amines are stronger bases because they have less degrees of freedom in a ring
	 pyridine	3°	5.25	Aromatic heterocyclic amines are weaker bases than aliphatic amines due to delocalization of the nitrogen lone-pair electrons making it less available for protonation
	 pyrrole	2°	0.2	
aromatic amines	 aniline	1°	4.63	Resonance stabalization of the lone pair makes arylamines less basic