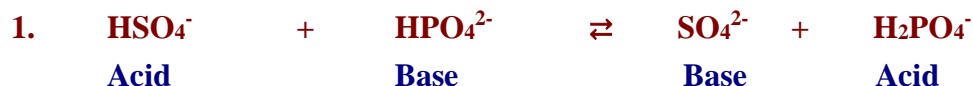


## Worksheet 4.3

### Using Acid Strength Tables

Acid-base reactions can be considered to be a competition for protons. A stronger acid can cause a weaker acid to act like a base. Label the acids and bases. Complete the reaction. State if the reactants or products are favoured.



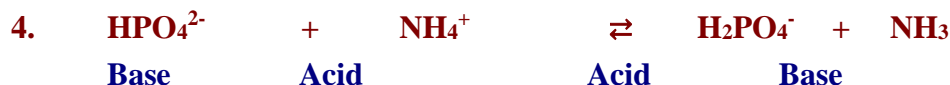
Products are favoured as  $\text{HSO}_4^-$  is a stronger acid than  $\text{H}_2\text{PO}_4^-$



Reactants are favoured as  $\text{H}_3\text{O}^+$  is a stronger acid than  $\text{HCN}$ .



Reactants are favoured as  $\text{H}_2\text{CO}_3$  is a stronger acid than  $\text{H}_2\text{S}$



Reactants are favoured as  $\text{H}_2\text{PO}_4^-$  is a stronger acid than  $\text{NH}_4^+$



Reactants are favoured as  $\text{OH}^-$  is a stronger base than  $\text{NH}_3$



Products are favoured as  $\text{NH}_3$  is a stronger base than  $\text{HPO}_4^{2-}$



Products are favoured as  $\text{HF}$  is a stronger acid than  $\text{H}_2\text{CO}_3$

## Worksheet 4.4

### Acid and Basic Anhydrides

Classify each formula as an acid anhydride, basic anhydride, strong acid, weak acid, strong, or weak base. For each formula write an equation to show how it reacts with water. For anhydrides write two equations.

Formula	Classification	Reaction
12. Na <sub>2</sub> O	<b>basic anhydride</b>	<b>Na<sub>2</sub>O + H<sub>2</sub>O → 2NaOH</b>
13. CaO	<b>basic anhydride</b>	<b>CaO + H<sub>2</sub>O → Ca(OH)<sub>2</sub></b>
14. SO <sub>3</sub>	<b>acid anhydride</b>	<b>SO<sub>3</sub> + H<sub>2</sub>O → H<sub>2</sub>SO<sub>4</sub></b>
15. CO <sub>2</sub>	<b>acid anhydride</b>	<b>CO<sub>2</sub> + H<sub>2</sub>O → H<sub>2</sub>CO<sub>3</sub></b>
16. SO <sub>2</sub>	<b>acid anhydride</b>	<b>SO<sub>2</sub> + H<sub>2</sub>O → H<sub>2</sub>SO<sub>3</sub></b>
17. HCl	<b>strong acid</b>	<b>HCl + H<sub>2</sub>O → H<sub>3</sub>O<sup>+</sup> + Cl<sup>-</sup></b>
18. NH <sub>3</sub>	<b>weak base</b>	<b>NH<sub>3</sub> + H<sub>2</sub>O ⇌ NH<sub>4</sub><sup>+</sup> + OH<sup>-</sup></b>
19. NaOH	<b>strong base</b>	<b>NaOH → Na<sup>+</sup> + OH<sup>-</sup></b>
20. HF	<b>weak acid</b>	<b>HF + H<sub>2</sub>O ⇌ H<sub>3</sub>O<sup>+</sup> + F<sup>-</sup></b>
21. H <sub>3</sub> PO <sub>4</sub>	<b>weak acid</b>	<b>H<sub>3</sub>PO<sub>4</sub> + H<sub>2</sub>O ⇌ H<sub>3</sub>O<sup>+</sup> + H<sub>2</sub>PO<sub>4</sub><sup>-</sup></b>