

- 23** 1. $\text{CH}_3\text{NH}_3^+(\text{aq}) + \text{CH}_3\text{CO}_2^-(\text{aq}) \rightleftharpoons \text{CH}_3\text{NH}_2(\text{aq}) + \text{CH}_3\text{CO}_2\text{H}(\text{aq})$
2. $\text{H}_3\text{O}^+(\text{aq}) + \text{CH}_3\text{CO}_2^-(\text{aq}) \rightleftharpoons \text{H}_2\text{O}(\ell) + \text{CH}_3\text{CO}_2\text{H}(\text{aq})$
3. $\text{H}_2\text{O}(\ell) + \text{CH}_3\text{CO}_2^-(\text{aq}) \rightleftharpoons \text{HO}^-(\text{aq}) + \text{CH}_3\text{CO}_2\text{H}(\text{aq})$
4. $\text{CH}_3\text{CO}_2\text{H}(\text{aq}) + \text{CH}_3\text{NH}_2(\text{aq}) \rightleftharpoons \text{CH}_3\text{CO}_2^-(\text{aq}) + \text{CH}_3\text{NH}_3^+(\text{aq})$
5. $\text{H}_3\text{O}^+(\text{aq}) + \text{CH}_3\text{NH}_2(\text{aq}) \rightleftharpoons \text{H}_2\text{O}(\ell) + \text{CH}_3\text{NH}_3^+(\text{aq})$
6. $\text{H}_2\text{O}(\ell) + \text{CH}_3\text{NH}_2(\text{aq}) \rightleftharpoons \text{HO}^-(\text{aq}) + \text{CH}_3\text{NH}_3^+(\text{aq})$
7. $\text{CH}_3\text{CO}_2\text{H}(\text{aq}) + \text{H}_2\text{O}(\ell) \rightleftharpoons \text{CH}_3\text{CO}_2^-(\text{aq}) + \text{H}_3\text{O}^+(\text{aq})$
8. $\text{CH}_3\text{NH}_3^+(\text{aq}) + \text{H}_2\text{O}(\ell) \rightleftharpoons \text{CH}_3\text{NH}_2(\text{aq}) + \text{H}_3\text{O}^+(\text{aq})$
9. $\text{H}_2\text{O}(\ell) + \text{H}_2\text{O}(\ell) \rightleftharpoons \text{HO}^-(\text{aq}) + \text{H}_3\text{O}^+(\text{aq})$
10. $\text{CH}_3\text{CO}_2\text{H}(\text{aq}) + \text{HO}^-(\text{aq}) \rightleftharpoons \text{CH}_3\text{CO}_2^-(\text{aq}) + \text{H}_2\text{O}(\ell)$
11. $\text{CH}_3\text{NH}_3^+(\text{aq}) + \text{HO}^-(\text{aq}) \rightleftharpoons \text{CH}_3\text{NH}_2(\text{aq}) + \text{H}_2\text{O}(\ell)$
12. $\text{H}_3\text{O}^+(\text{aq}) + \text{HO}^-(\text{aq}) \rightleftharpoons \text{H}_2\text{O}(\ell) + \text{H}_2\text{O}(\ell)$