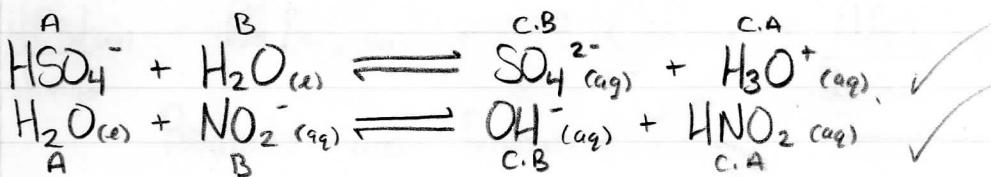


4. As well as the lack of evidence to support the formation of  $\text{NH}_4\text{OH}$  as a intermediate in the case of  $\text{NH}_3$  acting as a base contributes to the flaws. (3)
5. A Brønsted - Lowry acid is considered a proton ( $\text{H}^+$ ) donor in which reacts with a base. (2)

A Brønsted - Lowry base is considered a proton ( $\text{H}^+$ ) acceptor in which reacts with an acid.

6. a)  $\text{HSO}_4^- \rightarrow$  conjugate base =  $\text{SO}_4^{2-}$  ✓ (2)
- b)  $\text{CH}_3\text{CH}_2\text{COOH} \rightarrow$  conjugate base =  $\text{CH}_3\text{CH}_2\text{COO}^-$
- a)  $\text{NO}_2^- \rightarrow$  conjugate acid =  $\text{HNO}_2$  ✓ (2)
- b)  $\text{H}_2\text{PO}_4^- \rightarrow$  conjugate acid =  $\text{H}_3\text{PO}_4$

8. Water is considered as an "amphoteric" compound because it can react as both an acid or a base:



9. a)  $\text{N}_2\text{H}_4_{(aq)} + \text{H}_2\text{O}_{(l)} \rightleftharpoons \text{N}_2\text{H}_5^+_{(aq)} + \text{OH}^-_{(aq)}$  ✓ (4)
- |      |      |            |            |
|------|------|------------|------------|
| base | acid | conj. acid | conj. base |
|------|------|------------|------------|
- b)  $\text{CH}_3\text{COOH}_{(aq)} + \text{SO}_4^{2-}_{(aq)} \rightleftharpoons \text{CH}_3\text{COO}^-_{(aq)} + \text{HSO}_4^-_{(aq)}$
- |      |      |            |            |
|------|------|------------|------------|
| acid | base | conj. base | conj. acid |
|------|------|------------|------------|