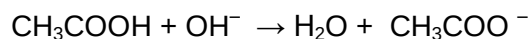


Equation (i) is more simply written as **net ionic equation**, as



For reactions between strong acids and bases the net ionic equation is always given by Eqn (ii). For such reactions, heat of neutralization is constant (– 56.1 kJ/mol H₂O formed).

A reaction between a **weak acid** (say, acetic acid) and a **strong base** (say, NaOH) is,



NaOH is almost completely dissociated whereas CH₃COOH is present mainly as undissociated molecule.

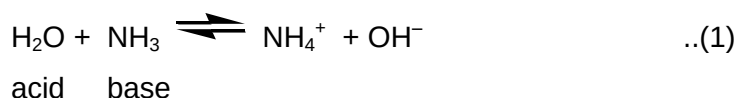
Limitations of Arrhenius's Theory

One of the most glaring limitations of this theory is in its treatment of the weak base ammonia, NH₃. According to Arrhenius, a substance must contain OH[–] in order to be a base. Where is the OH[–] in NH₃?

BRONSTED-LOWRY THEORY OF ACIDS AND BASES

According to Bronsted- Lowry, an acid is a **proton (H⁺) donor** and a base is a **proton (H⁺) acceptor**.

To describe the basic behaviour of ammonia which we had difficulty doing with Arrhenius theory, we can write



H₂O acts as an acid. It donates a proton (H⁺) which is gained by NH₃, a base. As a result of this transfer, the ions NH₄⁺ and OH[–] are formed.

The above reaction, when written in reverse order:

