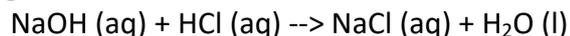


Answer on Question #72292, Chemistry / Inorganic Chemistry

What is the enthalpy change of this reaction in kJ/mol?



50 cm³ of HCl acid was mixed with 50 cm³ of sodium hydroxide solution. Each solution contained 0.01 mol solute. The temp rise was 12 degrees Celsius. Assume the density of all solutions is 1.0 g/cm³. And use energy transferred (J) = mass of solution * 4.2 * change in temperature.

Solution

There is a required formula in the assignment, and to use it we need the mass of solution. The total volume of solution is

$$V = 50 + 50 = 100 \text{ (cm}^3\text{)}.$$

As the density is 1.0 g/cm³, then the mass of solution is 100 g.

Find the energy transferred:

$$E = 100 \times 4.2 \times 12 = 5040 \text{ (J)}$$

Found energy transfers after the reaction between 0.01 mols of initial reactants. Calculate the energy that is given off after the reaction between 1 moles of initial reactants:

$$E = \frac{5040}{0.01} = 504\,000 \text{ (J/mol) or } 504 \text{ (kJ/mol)}$$

Answer

504(kJ/mol) is the enthalpy change of the reaction.