

Test in Chemistry for the Entrance Exam involves several questions with chemical calculations. The questions with chemical calculations cover the following topics: Solutions (concentrations of solution), Energetics and Ionic product of water, pH and pOH.

Example problems are listed below:

I Solutions (concentrations of solution):

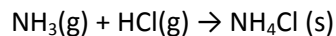
How many milliliters of sodium chloride (NaCl) solution whose molar concentration is 0.2 mol/L are needed to prepare 100 mL of solution whose molar concentration is 0.05 mol/L?

- a) 400
- b) 250
- c) 25
- d) 40

The correct answer is c): 25 mL

II Energetics:

Calculate the standard enthalpy change (ΔH_r°) for the reaction:



if the standard enthalpies of formation are: $\Delta H_f^\circ \text{NH}_3(\text{g}) = -46.1 \text{ kJ/mol}$, $\Delta H_f^\circ \text{HCl}(\text{g}) = -92.3 \text{ kJ/mol}$ and $\Delta H_f^\circ \text{NH}_4\text{Cl}(\text{s}) = -314.4 \text{ kJ/mol}$.

- a) +176.0 kJ/mol
- b) -176.0 kJ/mol
- c) -195.6 kJ/mol
- d) -762.2 kJ/mol

The correct answer is b): -176.0 kJ/mol

III Ionic product of water, pH and pOH:

Calculate the pH of sodium hydroxide solution that has a pOH of 2.

- a) 12
- b) 2
- c) 10
- d) 10^{-12}

The correct answer is a): 12