Answer on Question #44846 – Chemistry – Inorganic Chemistry

Question

Which of the following in soluble in water?

A) CS_2

B) C_2H_5OH

C) CCl_4

D) $CHCl_3$.

Please explain.

Answer

Correct option is **B) C_2H_5OH**

Solvents can be broadly classified into two categories: polar and non-polar. Generally, the dielectric constant (ε) of the solvent provides a rough measure of a solvent's polarity (the greater the dielectric constant the greater the polarity). Water is polar solvent (ε = 80.4). There is a general rule: polar substances are soluble in polar solvents and insoluble in non-polar solvents, and non-polar substances are soluble in non-polar solvents and insoluble in polar solvents. The only polar substance among given four options is ethanol (DC = 24.3), that is why ethanol is soluble in water. CS_2 (ε = 2.6), CCl_4 (ε = 2.2) and $CHCl_3$ (ε = 4.8) are non-polar and that is why they are insoluble in water.