In-Class Activity (ICA-Saline Concentrations)

In medicine, normal saline (NS) is the commonly-used term for a solution of 0.9% w/v of NaCl. Less commonly, this solution is referred to as physiological saline or isotonic saline, neither of which is technically accurate. NS is used frequently in intravenous drips (IVs) for patients who cannot take fluids orally and have developed or are in danger of developing dehydration. The molecular weight of sodium chloride is approximately 58.0 g/mole.

Q1: What is the mass (grams) of NaCl in one liter of saline solution? _____

Q2: What is the molarity of NaCl in NS? __________

Q3: What is the mMolarity of Na⁺, of Cl⁻, and of the total ion? __________________      _________________     ____________________

NS has a slightly higher degree of osmolarity (i.e. more solute per litre) than blood (hence, though it is said to be isotonic with blood in clinical contexts, this is a technical inaccuracy). Note that in chemistry, a normal concentration (also expressed as 1M NaCl\(^{aq}\)), of sodium chloride is 6.5 times more concentrated than medical NS.

Q4: What is the concentration (% w/v) of a normal concentration of sodium chloride?