Offbeat and Flashback Questions

1. The **biological half-life** or **elimination half life** of a drug is the time it takes for the drug to lose half of its pharmacological activity

   Salbutamol (INN) or **albuterol** (USAN), for example, is a short-acting drug used for the relief of bronchospasm in conditions such as asthma. Its half life is 7.0 hours.

   The half life formula is

   $C = C_o\,(½)^{t/\text{half life}}$

   C = amount of drug after t hours

   Co = original amount of drug

   t = hours drug spends in body

   a) A 60 kg adolescent receives a dose of 2.5 mg of salbutamol. What percent of the salbutamol will be eliminated in the adolescent's body 24 hours later?

   $C = C_o\,(½)^{t/\text{half life}}$

   $C = 2.5\text{ mg} * (½)^{24/7} = 0.233\ldots\text{ mg}$

   That means 2.5 – 0.23 = 2.267…mg were eliminated

   2.267…mg /2.5 = 91 % is eliminated

   b) **Cisplatin**, a platinum-based chemotherapy drug, has an average half-life of 65 hours. What could account for the fact that its half-life is longer than salbutamol's?

   Slower rate could be due to more complex chemical structure(more bonds) or a slower enzyme or set of enzymes.

2. a) How long does it take for equilibrium to be reached according to the following graph? **About 1 unit of time (scale is not specified)**

   b)Comment on the stoichiometry.(what is the ratio of reactant to product?)

The absolute value of the slopes is about equal, so the ratio seems to be 1:1