Answer on Question #44030, Chemistry, Other

Question:

Ethly acetate, C^4H^8O^2, is frequently used in nail polish remover.
Ethly acetate, C^4H^8O^2, is frequently used in nail polish remover. A typical of nail polish remover contains about 2.5 mol of ethyl acetate
(a) how many molecules are in the bottle of nail polish remover
(b) how many atoms are in the bottle
(c) how many carbon atoms are in the bottle

Answer:

a) The quantity of ethyl acetate molecules in the bottle is (N_a is Avogadro constant; n is amount of substance):

$$N = N_a \cdot n = 6.022 \cdot 10^{23}\, mol^{-1} \cdot 2.5 = 1.5055 \cdot 10^{24}$$

b) The quantity of atoms in the bottle is (14 is the quantity of atoms in ethyl acetate molecule):

$$N_A = N \cdot 14 = 1.5055 \cdot 10^{24} \cdot 14 = 2.108 \cdot 10^{25}$$

c) The quantity of carbon atoms in the bottle is (4 is the quantity of carbon atoms in ethyl acetate molecule):

$$N_c = N \cdot 4 = 1.5055 \cdot 10^{24} \cdot 4 = 6.022 \cdot 10^{24}$$