The largest number of molecules is in:

a)36 gm H_2o

b)28 gm CO

c)46 gm C_2H_2OH

d)54 gm NO_5

Solution:

1) Find the amount of compound by the following formula:
$$n = \frac{m}{M}$$
$$n - \text{ Amount of substance}$$
$$m - \text{ mass of the substance}$$
$$M - \text{ the molar mass of the substance}$$
$$n(H_2O) = \frac{36g}{18g/mole} = 2mole$$
$$n(CO) = \frac{28g}{28\ g/mole} = 1mole$$
$$n(C_2H_2OH) = \frac{46g}{43g/mole} = 1,07mole$$
$$n(NO_5) = \frac{54g}{94g/mole} = 0,57mole$$

2) Knowing this value as the amount of compound, get the number of molecules in it. For this amount of material, measured in moles, multiply by the Avogadro constant ($N_A = 6,022 \cdot 10^{23}$)
$$N = n * N_A$$

So,

$$N(H_2O) = 2 * 6,02 * 10^{23} = 12,04 * 10^{23}$$

$$N(CO) = 1 * 6,02 * 10^{23} = 6,02 * 10^{23}$$

$$N(C_2H_2OH) = 1,07 * 6,02 * 10^{23} = 6,44 * 10^{23}$$

$$N(NO_5) = 0,57 * 6,02 * 10^{23} = 3,43 * 10^{23}$$

Answer: The largest number of molecules is in 36 g of water (H_2O)