Question #83574

The mineral galena is primarily composed of PbS and has a density of 7.46 g/mL.
(a) How many moles of PbS are in 475 mL of PbS?
(b) Pyrite, FeS2 is a mineral referred to as Fool's gold because of its color. What is the mass of a sample
of pyrite that has the same number of moles as the galena sample in this problem?

Solution.

(a) Firstly, we should write formula for finding the mass of the sample through the density and volume.
m (PbS) = ρ (PbS) * V (PbS)
m(PbS) = 7.46 g/ml * 475 ml = 3543.5 g
Secondly, we should write formula for finding the amount of substance samples.
n(PbS) = m (PbS)/M (PbS)
n = 3543.5 g / 239 g/mol = 14.83 mol

(b) Firstly, we should write formula for finding the amount of substance samples.
n = m/M
m (FeS2) = n*M (FeS2)
m = 14.83 mol * 120 g/mol = 1779.6 g

Answer:

(a) n = 3543.5 g / 239 g/mol = 14.83 mol
(b) m = 14.83 mol * 120 g/mol = 1779.6 g