Answer on Question #42843, Chemistry, Physical Chemistry

Question:

with 0.05 moles of magnesium nitride and 2.00 liters of h20 how many moles of hydroxide salt would be produced

Answer:

Magnesium nitride is Mg_3N_2
Water – H_2O. 2 liters contain $n(H_2O) = \rho(H_2O)*V(H_2O)/M(H_2O) = 111$ moles, where V is volume, ρ – density of water.

Reaction:

Real: 0.05 moles 111 moles **X** moles

$$Mg_3N_2 + 6H_2O = 3Mg(OH)_2\downarrow + 2NH_3\uparrow$$

Theoretical: 1 mole 6 moles 3 moles

Here is excess of water (much more than 6*0.05 = 0.3 moles), so the amount of magnesium hydroxide $Mg(OH)_2$ is calculated using the amount of Mg_3N_2.

There is a proportion from stoichiometry of reaction equation:

1 mole of Mg_3N_2 gives 3 moles of $Mg(OH)_2$

So, 0.05 moles of of Mg_3N_2 would give **X** = 3*0.05 = 0.15 moles of $Mg(OH)_2$