**Quiz 5 Chemical Principles I 18 Oct Chem 1984 Fall 2013**

**Your name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_/25**

**Assume :**

**1 mol count=6\*1023**

**6HCl + 2Al -----🡪 2AlCl3 + 3H2**

 36 27 123 2 g/mol

**Given the balanced reaction and molecular weights above:**

1. How many **moles of Al** must be added to produce 7.5 moles of H2 ?

**Mol Al/mol H2 = 2/3=m/7.5=> m=2\*7.5/3=5**

**mol Al=\_\_\_5\_\_\_\_\_\_**

1. How many **grams of H2** are created by reacting 4 moles of HCl ?

**Mol H2/mol HCl= 3/6=m/4=>m=3\*4/6=2 moles H2 => 2 mol \*2 g/mol H2=4 g**

**grams H2 =\_4\_\_\_\_\_\_\_**

1. How many **grams of Al** must react to form 0.333 grams H2 ?

**0.333 g H2 = 0.333 g/2 g mol-1 =0.16665 mol H2**

**Mol Al/mol H2 = 2/3 = m/0.16665=>m=2\*0.16665/3=0.1111 mol Al**

**0.1111 mol Al\*27 g/mol =3 g**

**grams Al= \_\_3\_\_\_\_\_\_**

1. How many **molecules of HCl** are needed to create 13.667 g AlCl3 ?

13.6667 g AlCl3/123 g mol-1 =0.111 mol AlCl3

Mol **HCl = 6 = m => m= 6\*0.111 =0.3333 mol HCl => 0.333\*6\*1023 molecules**

**Mol AlCl3 2 0.111 2**  =2\*1023

**molecules HCl=\_\_\_\_2\*1023\_\_\_\_\_\_\_\_**

1. If you form **3.333 \*1022 molecules of H2 ,** how many grams of Al reacted ?

**Mol H2= 3.333\*1022/6.0\*1023 =0.05555**

**Mol Al/mol H2 = 2/3= m/0.05555 =>m= 0.03704 mol AL**

**Grams Al =0.03704\*27=1 g**

  **grams Al = \_\_\_\_1\_\_\_\_\_\_\_\_\_\_**