Answer on Question #66701, Chemistry / Inorganic Chemistry

What happens when each inorganic pigments is placed in each of the following solutions? Details below.

4 Inorganic Pigments: barium white, zinc yellow, chromium oxide green, prussian blue

3 Solutions at room temp: 3M NaOH, 3M HCl, 10% H2SO4

Please explain what happens to each pigment in each solution. Maybe even include a chemical equation?

Answer

1. $BaSO_4$ - barium white :

$BaSO_4 + 2\ NaOH = Ba(OH)_2 + Na_2SO_4$; dissolution of sediment;

$BaSO_4 + 2HCl = BaCl_2 + H_2SO_4$; dissolution of sediment;

$BaSO_4$ and H_2SO_4 do not react

2. $ZnCrO_4$ - zinc yellow:

$ZnCrO_4 + 2NaOH = Zn(OH)_2 + Na_2CrO_4$; we received a yellow white;

$ZnCrO_4 + 2HCl = ZnCl_2 + H_2CrO_4$; bleaching;

$ZnCrO_4 + H_2SO_4 = ZnSO_4 + H_2CrO_4$; bleaching;

3. Cr_2O_3 - chromium oxide green:

$Cr_2O_3 + 2NaOH = 2NaCrO_2 + H_2O$; bleaching;

$Cr_2O_3 + 6HCl = 2CrCl_3 + 3H_2O$; green became purple;

$Cr_2O_3 + 3H_2SO_4 = Cr_2(SO_2)_3 + 3H_2O$; green became pink;

4. $CoO*4Al_2O_3$ - prussian blue:

CoO and $NaOH$ do not react; $Al_2O_3 + 2\ NaOH = 2\ NaAlO_2 + H_2O$; without changes;

$CoO + 2HCl = CoCl_2 + H_2O$; $Al_2O_3 + 6\ HCl = 2\ AlCl_3 + 3\ H_2O$; blue became purple red or pink;

$CoO + H_2SO_4 = CoSO_4 + H_2O$; $Al_2O_3 + H_2SO_4 = Al_2(SO_4)_3 + H_2O$; blue became pink.