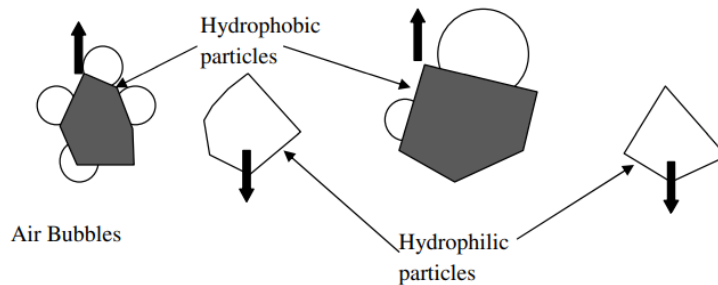


## Hydrophobicity/hydrophilicity



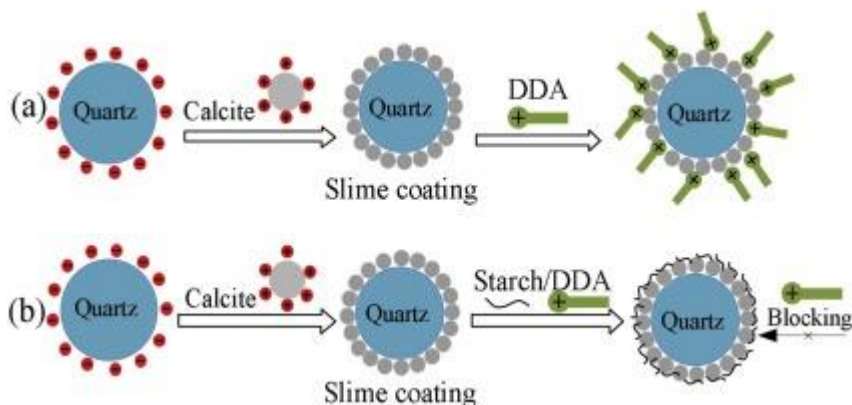
Minerals with **strong covalent or ionic surface bonding** are known as **polar types**. The polar surfaces react strongly with water molecules, and these minerals are **naturally hydrophilic**.

## Classification of Polar Minerals

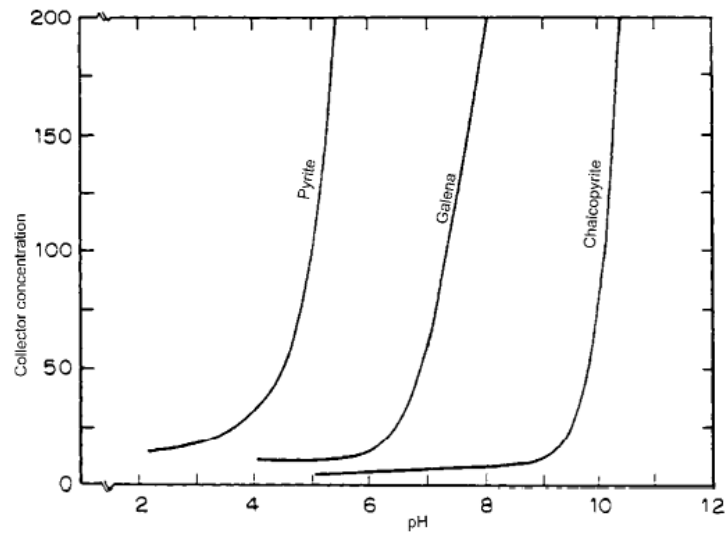
1. group		2. group	
Galena	PbS	Barite	BaSO <sub>4</sub>
Chalcopyrite	CuFeS <sub>2</sub>	Anhydrite	CaSO <sub>4</sub>
Covellite	CuS	Gypsum	CaSO <sub>4</sub> .2H <sub>2</sub> O
Bornite	Cu <sub>5</sub> FeS <sub>4</sub>	Anglesite	PbSO <sub>4</sub>
Chalcocite	Cu <sub>2</sub> S		
Pyrite	FeS <sub>2</sub>		
Pyrrhotite	Fe <sub>7</sub> S <sub>8</sub>		
Sphalerite	ZnS		
Stibnite	Sb <sub>2</sub> S <sub>3</sub>		
Cinnabar	HgS		
Natives	Au, Ag, Pt, Cu		
3a. group		3. group	
Malachite	Cu <sub>2</sub> CO <sub>3</sub> (OH) <sub>2</sub>	Flourite	CaF <sub>2</sub>
Azurite	2CuCO <sub>3</sub> .Cu(OH) <sub>2</sub>	Magnesite	MgCO <sub>3</sub>
Cerrusite	PbCO <sub>3</sub>	Dolomite	CaMg(CO <sub>3</sub> ) <sub>2</sub>
		Scheelite	CaWO <sub>4</sub>
		Siderite	FeCO <sub>4</sub>
		Monazite	(Ce,Ln,Di)PO <sub>4</sub>

4. group		5. group	
Hematite	Fe <sub>2</sub> O <sub>3</sub>	Zircon	ZrSiO <sub>4</sub>
Goethite	FeO(OH)	Beryl	Be <sub>3</sub> Al <sub>2</sub> Si <sub>6</sub> O <sub>18</sub>
Chromite	FeCr <sub>2</sub> O <sub>4</sub>	Garnet	Ca <sub>3</sub> Al <sub>2</sub> (SiO <sub>4</sub> ) <sub>3</sub>
Borax	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub>		
Rutile	TiO <sub>2</sub>		
Cassiterite	SnO <sub>2</sub>		

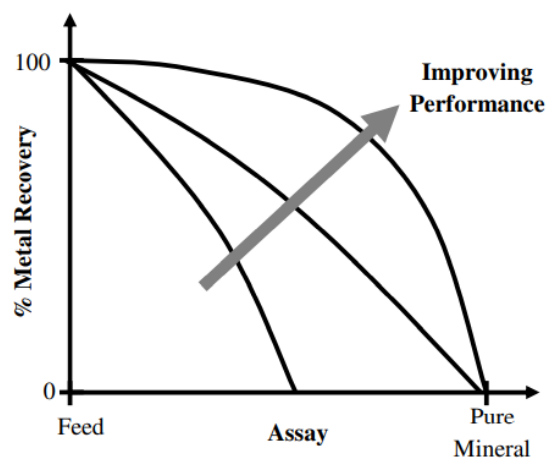
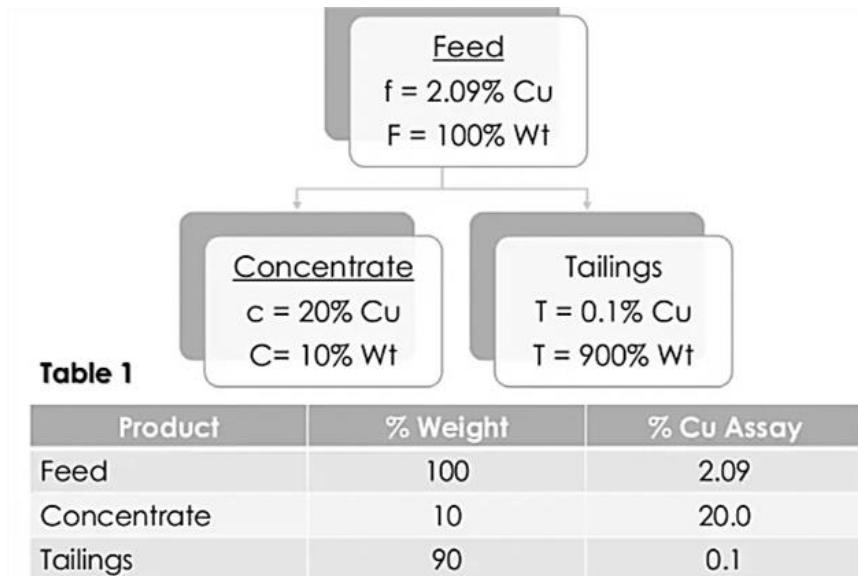
The degree of polarity increases from sulphide minerals through sulphates, to carbonates, halites, phosphates etc. then oxides-hydroxides and silicates and quartz.



## Lecture 5



**Figure 2.28** Critical pH curves for flotation with sodium dithiophosphate as collector for some sulfidic minerals.



**Figure 2:** Typical form of Grade/Recovery Curves for froth flotation

## Lecture 5