

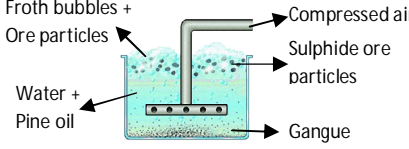
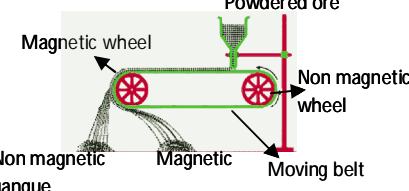
CLASS-10 PHYSICAL SCIENCES  
NEW TEXT BOOK  
2014 - 2015

**CHAPTER: 13 – PRINCIPLES OF METALLURGY**

**PERIOD PLAN-02 :** Steps involved in extraction of metal from ore

Concentration of ore – methods

(Hand picking, washing, froth floatation, magnetic separation)

Content Analysis	Class Room Environment	Teaching Learning Material
<p><b>Steps involved in extraction of metal from ore:</b> The extraction of a metal from its ore involves mainly 3 stages. (i) Concentration or Dressing (ii) Extraction of crude metal (iii) Refining or purification of the metal</p>	<p><b>Conversation:</b> About how we can get rice from paddy. What are the steps involved? (before cooking of rice)</p>	<p>Chart containing of steps in extraction of metal from its ore</p>
<p><b>Concentration of ore – methods:</b> The impurities present in the ore like sand, soil and dust are called gangue. Concentration or Dressing means, simply getting rid of as much of the unwanted rocky material as possible from the ore. Removing of impurities from the ore is called dressing of ore. Enrichment of grade of the ore is called dressing of the ore. Various physical methods are used to enrich the ore. This depends upon difference between physical properties of ore and gangue. The dressing methods are (i) Hand picking (ii) Washing (iii) Froth floatation (iv) Magnetic separation.</p>	<p><b>Conversation:</b> About minerals and ores. The gangue present in the mineral. What is concentration? What is enrichment? How can we separate husk from rice? How can we separate stones from sand?</p>	<p>Photographs of different Minerals and Ores with impurities</p>
<p><b>(i) Hand picking:</b> If the ore particles and the impurities are different in one of the properties like colour, size etc., Using that property either ore particles or impurities are handpicked to separate them.</p>	<p><b>Conversation:</b> About how can we separate stones from rice or dal in our daily life. This method is adopted to separate the impurities from ore.</p>	
<p><b>(ii) Washing:</b> Ore particles are crushed and kept on a slopy surface. They are washed with controlled flow of water. Less dense impurities are carried away by water flow, leaving the more dense ore particles behind.</p>	<p><b>Conversation:</b> About how can we separate dust from vegetables, rice and dal in our daily life. This method is adopted to separate the impurities from ore.</p>	
<p><b>(iii) Froth floatation:</b> This method is mainly useful for sulphide ores which have no wetting property whereas the impurities get wetted. The ore with impurities is finely powdered and kept in water taken in a floatation cell. Add a few drops of pine oil. Air under pressure is blown to produce froth in water. Froth so produced, takes the ore particles to the surface. The impurities settle at the bottom. Froth is separated and washed to get ore particles.</p>	<p><b>Explanation &amp; Conversation:</b> About how a sulphide ore can be dressed in froth floatation cell.</p> 	<p>Chart containing the diagram of Froth floatation cell with parts (OR) Animated Video</p>
<p><b>(iv) Magnetic separation:</b> If the ore or impurity, one of them is magnetic substance and the other is non magnetic substance then we can use magnetic separation to separate the impurities from ore.</p>	<p><b>Explanation &amp; Conversation:</b> About how a sulphide ore can be dressed in froth floatation cell.</p> 	<p>Chart containing the diagram Magnetic separation process (OR) Animated Video (OR) Working Model</p>