up to 10^{-3} m is called *crushing* and is carried out in crushers, from 10^{-3} to 10^{-6} m is called *grinding* (*splitting*) and carried out in mills. The measure of grinding is the degree of grinding, defined as:

$$\boldsymbol{i} = D_{initial} / D_{final},$$

where: $D_{initial}$ and D_{final} - this is the average particle size (equivalent diameter) before and after grinding, respectively. In some cases, the preparation process includes the operation of consolidating the powdered material by briquetting or agglomeration methods.

Dehydration is a method of *runoff*, *settling* and *drying*.

Drying is the process of removing moisture or other liquid from solid materials by evaporation and removal of the generated steam.

The drying condition is to ensure the inequality $P_m > P_c$, where P_m is the vapor pressure in the wet material being dried, and Pc is the partial pressure of vapor in the environment. The drying process is carried out in dryers of various designs, at atmospheric pressure or in vacuum.

Enrichment is the process of separating the useful part of the raw material (useful component) from the waste rock (ballast) in order to increase the concentration of the useful component. As a result of enrichment, the raw material is divided into a concentrate of the useful component and tails with a predominance of waste rock in them.

Quantitative indicators of the enrichment process are:

1. *The concentrate yield* is the ratio of the mass of the obtained concentrate $\boldsymbol{m_{concentrate}}$ to the mass of the enriched raw material $m_{enriched}$:

$$\boldsymbol{\eta_{concentrate}} = \boldsymbol{m_{concentrate}}/m_{\text{enriched}}$$

2. The degree of extraction of the useful component is the ratio of the mass of the useful component in the concentrate m_{cc} to its mass in the enriched raw material m_{cr}:

$$\boldsymbol{X_{extraction}} = \boldsymbol{m_{cc}}/\boldsymbol{m_{cr}}$$

3. *The degree of enrichment of raw materials* is the ratio of the mass fraction of the useful component in the concentrate μ_{cc} to its mass fraction in the enriched raw materials $\boldsymbol{\mu_{cr}}$:

$$X_o = \mu_{cc} / \boldsymbol{\mu_{cr}}$$

The choice of enrichment method depends on the state of aggregation and differences in the properties of the components of the raw materials.

In the enrichment of solid raw materials *mechanical*, *chemical* and *physico-chemical methods* are used.

The mechanical methods of enrichment include:

- *gravity method* based on different sedimentation rates of particles of different density and size in a gas or liquid flow, or in a field of centrifugal force;
- *electromagnetic method* based on different magnetic permeability of raw materials components;
- *electrostatic method* based on different electrical conductivity of the components of the raw material.

Chemical enrichment methods include dissolution when gold is extracted by mercury or cyanide methods.

The most common method of *flotation* belongs to *the physico-chemical enrichment methods*.

Flotation, where: *WR* – is waste rock, and firing, for example, in the preparation of iron from iron pyrites, is a method of enrichment of solid raw materials, based on the difference in the wettability of its components.

The wettability of particles of a substance is characterized by the work of adhesion at the interface of the phases of the system “solid-liquid” $W_{liquid\text{-}solid}$: