

Welcome students, this is about physical properties of minerals, specific gravity and luminescence. Outline is specific gravity of minerals and luminescence of minerals. Learning outcomes Students will be able to understand the meaning of specific gravity of minerals. Variation of specific gravities and luminescence as a property.

Specific gravity. The Greek letter rho symbolizes density. The density of a mineral is usually given in units of grams per centimeter cube. Density varies slightly depending on pressure or temperature, but most minerals have values between 2.00 and 8.00. Accurate determination of density can be difficult or impossible because it requires knowing the volume of the crystal, which can be difficult to measure with accuracy. Related properties, specific gravity is often used instead denoted by letter capital letter G. Specific gravity is the ratio of the mass of a mineral to the mass of an equal volume of water at one atmospheric pressure and four degrees Celsius. Because mass and weight are proportional, specific gravity is normally determined by comparing weights. The specific gravity of a mineral sample is defined as the ratio of weight of the sample in air to that loss in weight of the sample when immersed in water. While determining the specific gravity, it is very important to have the mineral sample as pure as possible, free from impurities and any other inclusions.

If W_1 represents the weight of the mineral sample in air and W_2 its weight when immersed in water, then the specific gravity of the sample can be written as follows. Specific gravity of the sample is equal to weight of the sample in air upon loss of the weight when immersed in water, which can also be written as rho is equal to $W_1 / (W_1 - W_2)$.

Luminescence

The emission of energy of a different wavelength from a mineral or any other substance that has been stimulated by an external energy source of some wavelengths. Examples of luminescence includes phosphorescence, Fluorescence and thermoluminescence. Phosphorescence and fluorescence is a type of luminescence in response to exposure to ultraviolet light X Rays or cathode Rays, which continues after the exposure ceases. Thermoluminescence is a type of luminescence caused by heating a mineral. Fluorescent minerals give off visible light when they're struck when they are struck by energy of a shorter wavelength. The invisible radiation from ultraviolet lamps, for example, may cause scheelite, willemite or fluorite to appear to glow in the dark. If the visible emission continues after the energy source is turned off, the mineral is phosphorescent. Pectolite is an example of phosphorescent mineral.

Thermoluminescent minerals, such as some tourmalines, give off visible light in the response to heating. Some varieties of fluorite, calcite and apatite also have this property. This is a photograph showing a selection of calcite specimen held by a Herbert Art Gallery and Museum, Coventry. This photograph shows how the specimen glows blue under shortwave UV light. This is a picture from Boltsburn Mine, Rookhope District, Weardale Pennines Durham, England UK.

This is for fluorite which shows luminescence. Hence we saw specific gravity of minerals that is different from density of minerals. We refer to specific gravity because determining density is very difficult since we cannot determine volume of a mineral. But while comparing but by comparing the weight of the mineral to the weight of the water we can determine its specific gravity. Luminescence as a property is due

to striking of the mineral by X Rays or ultraviolet Rays and the mineral giving out light in the visible spectrum. Even when the mineral is heated, it gives out wavelengths which could be seen with naked eyes that is called thermoluminescence.

This is the bibliography.

Thank you.