THERMODYNAMIC PROPERTIES FOR BERLINITE, ALPOB4S pdf

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Prase Occurrence of Quartz Quartz is one of the crystalline forms of silica, the essential building material for all silicates, and quartz can only form where silica is present in excess of what is consumed in the formation of other silicate minerals. Quartz may also be consumed during the formation of new silicate minerals, in particular at higher temperatures and pressures, and certain geological environments are "incompatible" with free silica and hence quartz. The largest amount of quartz is found as a rock-forming mineral in silica-rich igneous rocks, namely granite-like plutonic rocks, and in the metamorphic rocks that are derived from them. Under conditions at or near the surface, quartz is generally more stable than most other rock-forming minerals and its accumulation in sediments leads to rocks that are highly enriched in quartz, like sandstones. Quartz is also a major constituent of sedimentary rocks whose high quartz content is not immediately obvious, like slates, as well as in the metamorphic rocks derived from such quartz-bearing precursor rocks. Quartz Veins At higher temperatures and pressures quartz is easily dissolved by watery fluids percolating the rock. When silica-rich solutions penetrate cooler rocks, the silica will precipitate as quartz in fissures, forming thin white seams as well as large veins which may extend over many kilometers Bons, ; Wangen and Munz, , Pati et al, In most cases, the quartz in these veins will be massive, but they may also contain well-formed quartz crystals. Phyllites and schists often contain thin lenticular or regular veins of so-called "segregation quartz" Vinx, that run parallel to the bedding and are the result of local transport of silica during metamorphosis Chapman, ; Sawyer and Robin, Silica-rich fluids are also driven out of solidifying magma bodies. When these hot brines enter cooler rocks, the solution gets oversaturated in silica, and quartz forms. Along with the silica, metals are also transported with the brines and precipitate in the veins as sometimes valuable ore minerals. The association of gold and quartz veins is a well-known example. Quartz is the most common "gangue mineral" in ore deposits. Quartz is best known for the beautiful crystals it forms in all sorts of cavities and fissures. The greatest variety of shapes and colors of quartz crystals comes from hydrothermal ore veins and deposits, reflecting large differences in growth conditions in these environments chemistry, temperature, pressure. Splendid, large crystals grow from ascending hot brines in large fissures, from residual silica-rich fluids in cavities in pegmatites and from locally mobilized silica in Alpine-type fissures. An economically important source of amethyst for the lapidary industry are cavities of volcanic rocks. Small, but well-formed quartz crystals are found in septarian nodules, and in dissolution pockets in limestones. Well-formed quartz crystals that are fully embedded in sedimentary rocks and grew during diagenesis so-called authigenic quartz crystals are occasionally found in limestones, marls, and evaporites e. Euhedral quartz crystals that are embedded in igneous rocks are uncommon. Quartz is among the last minerals that form during the solidification of a magma, and because the crystals fill the residual space between the older crystals of other minerals they are usually irregular. Euhedral, stubby bipyramidal quartz crystals are occasionally found in rhyolites. These are usually paramorphs after beta-quartz with hexagonal symmetry, quartz crystals whose trigonal habit shows that they grew as alpha-quartz are very rare in volcanic rocks e. Flick and Weissenbach, Only rarely are euhedral quartz crystals seen embedded in metamorphic rocks Kenngott, ; Tschermak, ; Heddle, Identification In most cases quartz is easy to identify by its combination of the following properties: Note that in macrocrystalline quartz the fracture surfaces have a vitreous to resinous luster, whereas in cryptocrystalline quartz chalcedony fractured surfaces are dull. Crystals are very common and their usually six-sided shape and six-sided pyramidal tips are well-known. Intergrown crystals without tips can often be recognized by the presence of the characteristic striation on the prism faces. Quartz as a rock-forming mineral, in particular as irregular grains in the matrix, occasionally poses problems and may require additional means of identification. It may be confused with cordierite pleochroic, tendency to alteration and nepheline lower hardness, geological environment incompatible with quartz. In thin sections macrocrystalline quartz appears clear and homogeneous, with blue-gray to white or bright yellow interference colors and a low relief. Quartz does not show alterations at grain boundaries. Strained quartz grains from metamorphic rocks show a so-called "undulatory extinction" Blatt and Christie, ID Requirements on Mindat Quartz is one of the few minerals on Mindat where "visual identification" may be accepted as a method of identification for new locality entries and photos of well-formed crystals. In other cases, at least hardness should be checked, too. For quartz as a rock-forming mineral visual identification is often insufficient. Handling Quartz Quartz normally does not require special attention when handled or stored. At ambient conditions, quartz is chemically almost inert, so it does not suffer from the problems seen in many other minerals. The only problem for the collector is dust, which will find and cover your crystals, no matter what you do. Quartz crystals that contain large fluid or gas inclusions may crack when heated - skeleton quartz is the most sensitive variety in this respect - but most quartz specimens can take some heat, like cleaning in warm water, without being damaged. Quartz is hard but quite brittle, and with some effort, one can damage a crystal even with things that are much softer. The edges of the crystals are very often slightly damaged because crystals were not kept separate from each other. Amethyst, smoky quartz and natural citrine will also pale, but it takes very long. Mild ultrasonic cleaning is usually not a problem as long the crystals are not internally cracked, but some varieties may be damaged, in particular amethyst due to its polysynthetic Brazil law twinning and skeleton quartz with liquid and gas inclusions. Rock Currier wrote a Mindat article on cleaning quartz that is worthwhile reading:

2: Quartz: Quartz mineral information and data.

The thermodynamic properties of berlinite are given at integral temperatures to K based upon an enthalpy of formation of Â± kJ'mol"1 with red phosphorus as the reference state.

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