Plagioclase Encyclopedia Article

Plagioclase

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Contents

Plagioclase Encyclopedia Article.....1

Contents.....2

Plagioclase.....3

Plagioclase

Plagioclase is a form of the mineral **feldspar**. All feldspars are **crystals** of **aluminum, oxygen**, and **silicon**, plus a major additive. In the case of plagioclase, the additive is calcium, sodium, or a blend of both. Miscellaneous impurities may also be present.

Like other feldspars, plagioclases have a vitreous (glassy) luster, are translucent or transparent, and are typically pink, gray, or white in color. Plagioclase cleaves along two planes that intersect at about 86 degrees, hence its name (from the Greek *plagio*, slanted, and *clase*, breaking). About 29% of the earth's **crust** consists of plagioclase.

There are two pure or extreme forms of plagioclase. Albite ($NaAlSi_3O_8$) contains sodium but no calcium, and anorthite $CaAl_2Si_2O_8$ contains calcium but no sodium. Many plagioclases consist of both **minerals** microscopically blended to form what is termed a solid solution. Plagioclase blends can occur along a linear continuum from albite to anorthite, intermediate minerals being mixtures of both. Plagioclase with 10–30% anorthite is defined as oligoclase; 30–50%, andesine; 50–70%, labradorite; and 70–90%, bytownite. The remainder in all cases is albite. A plagioclase with less than 10% anorthite is classified simply as albite, while one with less than 10% albite is classified simply as anorthite. A continuous, evenly represented series of plagioclases is not actually found in the field; oligoclases with anorthite percentages in the low twenties are most common, while some other points on the continuum are scarcely represented at all. The plagioclases are difficult to distinguish from each other without laboratory tests.

Many plagioclases are zoned. Zoning is the concentric or onion-skin structuring of an individual plagioclase crystal (often only a few millimeters long) with layers of varying sodium–calcium content. For example, a plagioclase crystal may consist of an andesine core (30–50% anorthite) surrounded by thin shells or zones of labradorite (50–70% anorthite) alternating with zones of andesine. Zoning records the chemical and thermal environment in which a plagioclase crystal formed.

Plagioclases are used for ceramics and glassmaking, and several gemstone varieties exist.

See Also

Bowen's Reaction Series; Mineralogy