HSCAS - Complex Silicate Definition

Analysis by P. Bunger, PhD - AZOMITE is a natural feed additive and soil re-mineralizer mined in Utah. It is OMRI listed for use in organic production. It contains a broad spectrum of over 70 elements. It was formed by a natural volcanic eruption and the volcanic ash was deposited into an ancient seabed. This sea was fed by rivers from around the region. For a long time the deposit was at the bottom of the seabed but eventually the sea dried. Tectonic activity fractured and lifted the seabed up to the surface. The mineral deposit is now a series of pink hogbacks (hills) where AZOMITE® is mined exclusively by AZOMITE Mineral Products, Inc. From a geological standpoint the volcanic ash deposit's major components are classified as Feldspars, Quartz and Calcites. The deposit does contain a small amount of Montmorillonite. **Feldspars** ($KAlSi_3O_8$ - $NaAlSi_3O_8$ - $CaAl_2Si_2O_8$) are a group of rock-forming tectosilicate minerals which make up as much as 60% of the Earth's crust. **Quartz** is the second most abundant mineral in the Earth's continental crust (after feldspar). It is made up of a continuous framework of SiO_4 silicon-oxygen tetrahedra, with each oxygen being shared between two tetrahedra, giving an overall formula SiO_2. **Calcite** is a calcium carbonate ($CaCO_3$). **Montmorillonite** is a hydrated sodium calcium aluminum magnesium silicate hydroxide $(Na,Ca)_{0.33}(Al,Mg)_2(Si_4O_{10})(OH)_2{\cdot}nH_2O$. In addition there are many minor mineral compounds resulting in a typical analysis that identifies over 70 elements. Once this natural product is crushed and intermixed, the chemical composition of this complex silicate is defined as a Hydrated Sodium Calcium Aluminosilicate ($NaK_2Ca_5A1_3Si_{21}O_{70}6H_2O$) for shipping within the USA for use as a feed ingredient.

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Montmorillonite is a hydrated sodium calcium aluminium magnesium silicate hydroxide $(Na,Ca)_{0.33}(Al,Mg)_2(Si_4O_{10})(OH)_2{\cdot}nH_2O$. Potassium, iron, and other cations are common substitutes, the exact ratio of cations varies with source.