Hibbingite - Swimming Pool Mineral

The discovery of a new mineral, named hibbingite, from Minnesota was announced recently, and details about it have just now appeared. It is an interesting mineral that may turn up in many unexpected places.

Hibbingite's formua is given as gamma Fe2(OH)3Cl. The "gamma" distinguishes hibbingite from two other compounds with the same formula (refered to as alpha and beta) made artificially in the lab. Alpha and beta are hexagonal, but hibbingite is orthorhombic, making it quite different crystallographically. Hibbingite forms grains and veins with serpentine in drill core taken from 5 different spots in the Duluth Complex between Hibbing and Ely. It is colorless to pale green, weathering red and appears to have 1 cleavage. The largest known grains are 0.027 inches long, making its other optical and physical properties hard to establish. It is also very soluble in water. In fact, its solubility is so high that, in humid air the mineral would dissolve out of the investigator's slide, leaving a salty coating. Clearly few rockhounds have samples of this sitting unrecognized in their collections.

The mineral's solubility was the key to its discovery. In 1991, researchers noted that some drill core in their labs was being coated by salt and akaganeite, another iron hydorxide. A study undertaken to see what in the cores was breaking down to form this coating discovered the hibbingite. Analysis, approval of the name by the International Mineralogical Association and publication of the data took 3 years.

Hibbingite has since been found in a number of other environments, and may be relatively common, if hard to spot and preserve. It has also been found in gabbros at Sudbury, Canada and Noril'sk, Russia. It occurs in crusts formed during the weathering of several iron meteorites. The discoverers, a group of European mineralogists, speculate that the mineral forms when chlorine-rich fluids percolate through iron-rich rocks. Such fluids have been implicated in concentrating ore deposits of platinum group metals in gabbros. If so, hibbingite may be a good mineral to look for in exploring for such deposits. It may also be widespread in the ocean crust where sea water circulates through basalt lavas. The authors also speculate that hibbingite might occur in the Martian soil. Spectral data from the Red Planet confirm the prescene of iron hydroxides there, but no one knowns what minerals these chemicals might appear in. Finally, hibbbingite has been found in corroded steel bars around swimming pools, where chlorinated waters seeped into and around the steel.Who knows, maybe the first known cabinet-sized specimen of hibbingite crystals is forming right now in your back yard under that leaky pool!

- Dr. Bill Cordua, University of Wisconsin-River Falls

Reference:

Saini-Eidukat, Bernhardt, Henryk Kucha and Hans Keppler, 1994, "Hibbingite - Gamma Fe2(OH)3Cl, a New Mineral from the Duluth Complex with Implications for the oxidation of Fe-bearing compounds and the transport of metals"; American Mineralogist, vol. 79, p. 555-561.