## Hyperalkaline State of Natural Substance: Its Mineralogical Criteria and Role in the Formation of Unique Deposits

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The deep zones of the nepheline syenite massifs of Khibina and Lovozero (Kola Peninsula) contain abundant hyperagpaites—pegmatoid rocks supersaturated in alkaline, volatile, and rare elements. Their distinctive features are: an abundance of minerals soluble in water or readily altered under atmospheric conditions, extraordinary diversity of mineral species, and close spatial and paragenetic relation to unique rare-metal and phosphate deposits—loparite, eudialyte, apatite, etc.

Among the hyperagpaitic rock minerals are the most alkaline water-soluble carbonates, silicates, and phosphates ever found in nature (such as natrite, natrosilite, and olympite). Their discovery is in fact the discovery of a new phenomenon—natural substance being in the hyperalkaline state. In this state, all electropositive elements less basic than Na behave as amphoteric; this stimulates their transition from the cationic part into the much more capacious anionic part of the structure of agpaitic magmas, and the latter become universal solvents, resulting in the accumulation of enormous amounts of useful components: P, Nb, Ta, Ti, Zr, Hf, REE, U, Th, Al, Ga, Sr, Ba, Be, Na, K, F... This determines the gigantic sizes of the deposits related to agpaitic magmatism, their multicomponent nature, and the presence of a vast array of minerals of unusual compositions, structures, and properties. Differentiated massifs of nepheline syenites with hyperagpaitic derivatives attain enormous sizes, but occur very rarely. They share many mineralogical, geochemical, and petrogenetic features with carbonatites, kimberlites, and lamproites.