The Spinels Unit Cell Parameter as Diamondpotentiality Indicator

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The Russia (Yakut and Archangel kimberlite provinces), South Africa,North America and Australia spinels grains (about 500) content from different types deep rocks was discovered.The spinels are characterised by two types of substitutions:1)$Cr^{(3+)}$-$Al^{(3+)}$, 2)$Cr^{(3+)}$–$Fe^{(3+)}$+$Ti^{(4+)}$.

The clear lineal dependance between unit cell parameter **(a_0)** and oxides contents was not observed. The obtained data are testified the limitations of using the diagram based on the Yakut and Archangel regions spinels X-ray data.The lineal dependance can be observed within the samples with $Cr^{(3+)}$–$Al^{(3+)}$ or $Cr^{(3+)}$–$Fe^{(3+)}$ isomorphism.The realisation both substitutions schemes and also enough amount of titanium (more than 2 mas.%) in spinel structure and the wide substitutions between $Mg^{(2+)}$–$Fe^{(2+)}$ disturb the lineal dependance between oxide contents and **a_0 :** decreasing **a_0** is held by decreasing Al_2O_3, and increasing **a_0** depends not only from chrome (III) oxide, but from Cr_2O_3,Fe_2O_3 and TiO_2,MgO and FeO togerther influence. Therefore during first steps searching spinels upon X-ray data one can get highferrous and titanious varietes.

The two lines have been identified between **a_0** and IR-spectra absorbence maximum within spinels from kimberlites which indicates on a crystallyzation consequence and a fluid-magmatic differentiation on the first mantle magmas.

This approach also can be used as a guide by Geological Enterprises to search spinels as mineral-indicators on diamondferrous rocks.

Keywords: spinels, unit cell parameter, IR-spectra absorbence maximum