verter operating, the voltage of winding 12 also equals zero.

If transistors 1 and 2 trigger simultaneously because of a defect in the control system or, for example, longer recovery of the cut-off during the transistor warm-up, or due to some other reasons, through-fault occurs, and the current flows through all three primary windings 6, 7, 11 of transformer 5 by-passing the load (completely or partially). Uncompensated magnetic flow arises, inducing voltage on winding 12 of transformer 5. Until transformer 5 is not full, the let-through current equals the magnetization current, i.e. it is negligibly small and is not dangerous for transistors.

So, protection against through-faults does not let the current grow till a dangerous level during the saturation of transformer 5. This time period could be set longer for a transformer, than the time of protection response to the switch-off signal from winding 12. Moreover, there is no need to exaggerate the recovery time for the transistors cut-off, as during the short-term «blockage» the let-through current is negligibly small, and the short output impulses on winding 12 could be blocked with the help of a duration selector, without switching off the converter. The size of the additional transformer 5 is negligibly small, its weight does not exceed 0,07 kg. The excluded from the device choke weights considerably more.

To sum up, the new appliance (fig.1) let reduce the through-fault current, widen the frequency passband of the converter, use it voltage properly, as well as make the converter more reliable in general and reduce its weight and size.

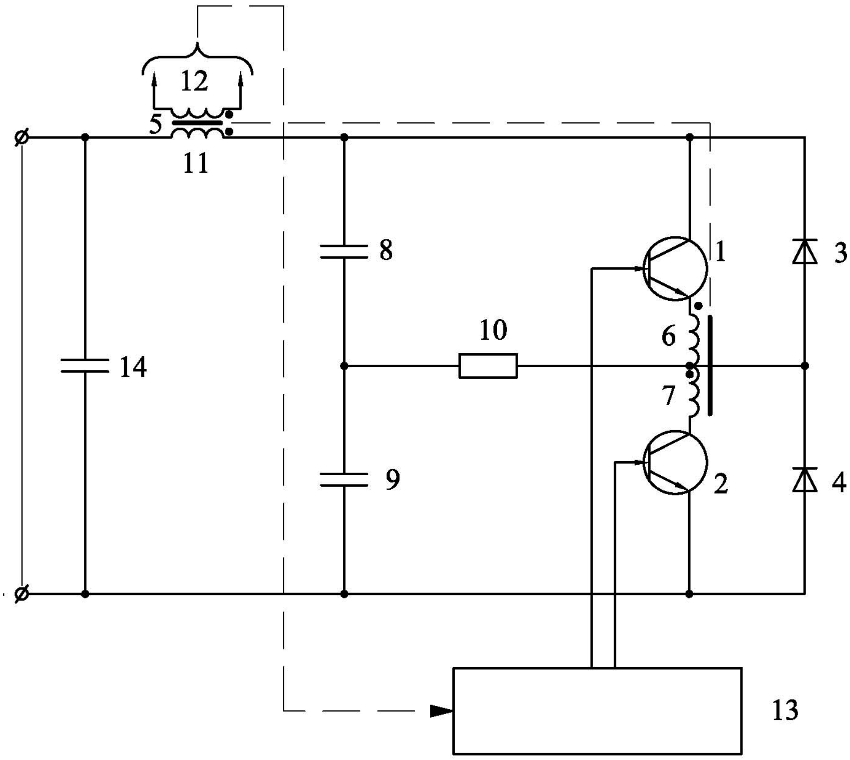

Fig. 1.

References

1. «Castolin GmbH» – Germany, «Kraftzwerg», 2005.

2. V.A. Pryanishnikov. «Electronics», St. Petersburg: Korona Print, 1998.

3. Single-phase half-bridge converter. Russian Patent № 2291550 registered 10.01.2007. Authors: Magazinnik L.T., Magazinnik G.G.

The work was submitted to international scientific conference «Priorities for Science, Technology and Innovation», Egypt (Sharm el-Sheikh), November 20-27, 2008. Came to the editorial office on 04.05.2009.

FLUID REGIME OF GRANITOIDS OF THE BELOKURIHINSKY COMPLEX (ALTAI MOUNTAINS)

Tabakaeva E.M.
Biysk Pedagogical State University
Biysk, Russia

This article presents a results of study of fluid regime of granitoids of the belokurihinsky complex. The meanings of ferrous ($f = ((Fe+Mn) \div (Fe+Mn+Mg)) \times 100\%$) and aluminous ($l = (Al \div (Al+Fe+Mg+Si)) \times 100\%$) compositions, octahedral coordination of aluminium are determined by means of study of composition of

biotite. Taking into account the features of the fluid regime and of calculated rare metal index had determined potential ore mineralization.

The gabbro-granitic Belokurihinsky complex includes a number of intrusions which earlier were considered independent [4]. Among them are the Aisky massif located to the east of the petrotypical Belokurihinsky massif as well as the Tadzhilinsky, Tarkhatinsky, Aturkolsky massifs located in the southeast of the Altai Mountains. The intrusives of the Belokurihinsky complex can also be found in the Rudno-Altai structure-formation zone (the Tigireksky, Savvuschinsky massifs) and in the Salair (the intrusives of the earlier distinguished Zhernovskoi complex) [2].

The matter composition and occurrence conditions of granitoids of the Belokurihinsky arial are typical for granite-leucogranitic formation (peraluminous granites) [1].

The fluid regime of the Belokurihinsky complex differs by openness in a fluorine mode. P-T conditions of granitoids crystallization show that the initial phases of the Belokurihinsky massif formation were characterized by relatively increased crystallization temperatures (790-760ºC), at the lowest possible concentrations of fluorine in the magmatogene fluids and their low redoxation. Biotites of these granitoids are characterized by decreased ferrous and increased aluminiferous composition. General pressures during the solidus of the granitoids initial phases did not exceed 1-3 MPa (by relation Al_{IV} and Al_{VI} in the hornblende of granodiorites and melanogranites). On the whole the rocks of the Belokurihinsky arial crystallized in the extremely oxidizing conditions and their solidus was carried out above the magnetite-hematitic buffer.

The moderate-alkaline granites and leucogranites of the Osokinsky, Zhernovskoi and Kuranovsky shoots crystallized at much lower temperatures (640-660ºC). The magmatogene fluids of the leucogranites contain much higher concentrations of a fluoric acid. This acid is probably responsible for the decrease in the solidus temperature of these rocks as well as the potential ore mineralization. The oxyfluoride ligands and complexes are known to influence significantly on the transfer of such metals as tungsten, molybdenum, beryllium, rubidium and others. The composition of biotite of the above-mentioned shoots differs by the high concentrations of octahedral coordination of aluminium (0,34-0,39). Unlike them the biotites of leucogranites of the Belokurihinsky massif have deficiency of octahedral coordination of aluminium (to – 0,04). The pegmatites have even greater deficiency of octahedronic aluminium. The latter underwent a contrast inversion of the fluids redoxation (0,39). The concentration of the fluoric acid in the fluids of pegmatites increased 10 times. The leucogranites of the Osokinsky massif crystallized in the highest oxidizing conditions.

The fluid regime of the Aisky arial granitoids was characterized by the abundance of various volatile components (fluorine, water, boron, phosphorus). Experimental data got during the silicate melts study [3] showed that saturated with water and fluorine granitic magmas do not finish crystallization at the solidus temperature of usual granites. As a result they become low-temperature melts that crystallize at a temperature of 575±25ºC (at the pressure of 101 MPa). Our data on the finishing phases of the Aisky leucogranites with fluorite are close to the above-mentioned parameters.

Taking into account the features of the fluid regime and the concentration of volatile components, potential ore mineralization of the intrusive formations can be determined by the rare metal index calculation according to L.V. Tauson – $F(Li+Rb)\div(Sr+Ba)$. According to our data [2], the concentration of fluorine and the rare metal index increase considerably from monzogabbro to leucogranites with fluorite. Herewith, the figure of the latter (6178,3) and petro-geochemical parameters of moderate-alkaline leucogranites are rather close to those of peraluminous rare metal leucogranites (6800). Similar parameters for leucogranites with fluorite come nearer to lithium-fluoric granites with which greisen and pegmatite mineralization of tin, tantalum, niobium in the studied area are connected spatially and paragenetically.

References

1. Vladimirov, A.G. et al. (1997). Late Paleozoic-premesozoic granitoic magmatism of Altai. *Journal of Geology and Geophysics*, vol. 38, no. 4, pp. 3-17.

2. Gusev, A.I., Gusev, N.I., Tabakaeva, E.M. (2008). *The petrology and ore mineralization of the Belokurihinsky complex of Altai*. Biysk: BPSU.

3. Kovalenko, V.I. et al. (1974). The experimental research of melting and crystallization of topazceous quartz keratophyres (ongonites) in the presence of water and fluoric acid solutions. *DAN USSR*, vol. 215, no 3, pp. 681- 684.

4. *The updated schemes of inter-regional and regional correlation of magmatic and metamorphic complexes of the Altai-Sayan folded area and the Yenisei Range* (2007). Novosibirsk: SSRIGG&MS, pp. 217-218.

The work was submitted at all-student e-scientific conference "Student Research Forum, February 15-20, 2009. Came to the editorial office on 17.06.2009.