

HYDROCHEMICAL ZONAL ALLOTMENT ON THE EXAMPLE OF SERBIA'S MAGMATIC MASSIFS

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Hydrochemical zonal allotment is characteristic of many geological structures. It is most often related to hydrodynamic zonal allotment, namely to the way and velocity of water replacement. Chemical zonal allotment of groundwaters is shown on the example of some magmatic massifs (granodioritic and andesite-dacite) on the territory of Serbia. The first or upper hydrochemical zone is related to the first, namely upper hydrodynamic zone. This zone comprises groundwaters in intensively cracked magmates at the surface parts of the massif and it is characterized by fast water replacement. Groundwaters of this zone are hydrocarbonate-calcium ($\text{HCO}_3\text{-Ca}$). The second or lower hydrochemical zone coincides with the zone of deeper circulations along distinctive tectonic discontinuities with predominantly ascendant movement of groundwaters. Certain changes take place in the chemical composition of groundwaters, reflecting, first of all in ion exchange ($\text{Ca} \leftrightarrow \text{Na}$), thus hydrocarbonate-sodium ($\text{HCO}_3\text{-Ca}$) waters prevail in this zone. Distinctive hydrochemical zonal allotment, with the specifics in relation to unaltered magmates, also takes place in the parts of andesite-dacite massifs, taken by subsequent hydrothermal changes and particular sulphide minerals enrichment. The first hydrochemical zone is characterized by sulphate-calcium (SO_4Ca) waters with increased content of particular metals (Fe, Al, Cu, Zn, Pb, Mo, As etc). The change of chemical content is related to depth, therefore in lower, namely second hydrochemical zone, there are sulphate-sodium ($\text{SO}_4\text{-Na}$) with considerably lower metal contents in relation to the upper zone