



Weathering products of plutonic acid rocks ranging from alkali feldspar granite to tonalite, located in Lower Silesia, SW Poland

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The aim of this research was to determine differences in weathering products of igneous acid rocks consisted of different amounts of alkali feldspars and plagioclases. Regolithes, regosols and cambisols derived from different granitoides, located in Sudety Mountains, Lower Silesia, SW Poland, were investigated. The examined parent rocks were alkali feldspar granites (leucogranites), granites, granodiorites and tonalites. Rock samples were analyzed with polarization microscope to determine mineralogical composition, while clay fraction samples separated from soil were analyzed with X-ray diffractometer. Microscopic observations of fresh, nearly not weathered granitoides indicated the presence of few grains altered into various clay minerals and chlorites. Potassium feldspars transformed into kaolinite-illite secondary minerals, plagioclases altered into sericite, while biotite transformed into chlorites. X-ray diffraction analyses of regolithe revealed presence of kaolinite, illite, chlorite and vermiculite. Clay fraction separated from soil and regolithes, apart of secondary minerals, indicated the presence of sericite, muscovite, K-feldspar and quartz. Obtained results show that amounts of secondary minerals depend on type of granitoides. Kaolinite was a main product of weathering of igneous rocks rich in alkali feldspars, such as granites and especially leucogranites. Plagioclase rich granitoides, such as granodiorites and particularly tonalites, led to forming mainly illite. However, direct relations between parent rock and composition of clay minerals formed in result of weathering, were not strongly marked. Differences in mineralogical composition of investigated granitoides were confirmed by results obtained with X-ray diffraction of soil material. Reflects of potassium feldspar found in leucogranites were more and more negligible through granites, granodiorites to tonalites. No evident dependences were

found between presence of vermiculite or chlorites and the kind of examined granitoides. More chlorites occurred in biotite enriched granite, than in other granites. Illite-chlorite mixed-layered products of weathering was observed as well.