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## **Binders types and their relation in flysch sandstones – a case study**

### **Abstract**

Scanning electron microscope with energy dispersive X-ray system (SEM-EDX), cathodoluminescence (CL) and X-ray diffraction (XRD) allowed to recognise and image the following binders in flysch sandstones by the example of the Cergowa sandstones from the Outer Carpathians:

I            some generations of carbonate cement: (i) three generations of calcite cement varying in iron and manganese content, (ii) dolomite, (iii) ankerite and (iv) siderite cements and

II           several types of clay minerals which represent matrix: (i) kaolinite, (ii) illite, (iii) smectite, (iv) chlorite and (v) glauconite.

Spatial relationships illustrated by SEM and CL images between framework grains, cement and matrix suggest the most plausible sequence of diagenetic phases responsible for cement precipitation and a supposed distinction between allogenic clays in the form of matrix and authigenic clays as pore fillings/linings because their characters make them often undistinguishable.

The combination of all these binders resulted in exceptionally strong cementation of the Cergowa sandstones, which is expressed by their very high hardness and resistance to abrasion, freezing and thawing, hence recognition and characteristics of sandstones binders seem so important and advisable.