# ALBITE OF SECONDARY ORIGIN, AFTER PERTHITE, IN SANDSTONES OF THE CHARNY FORMATION, QUEBEC

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The sandstones of the Charny Formation near Quebec City contain about 15% detrital feldspar which is practically all albite. Other constituents are quartz grains (50%), fine-grained chloritic matrix (20%), and patches of calcite. Most of the feldspar is untwinned and contains numerous "dust" inclusions. Many grains show a lamellar microstructure of sub-parallel, inclusion-rich, and inclusion-poor laminae, which makes an angle of 75° with 001. The only known feldspar with structure having this orientation is film perthite. The sandstones contain 1.0 to 3.5% $K_2O$ and the $K_2O/Na_2O$ ratio is close to unity; thus, they are somewhat enriched in $Na_2O$ compared with the average sandstone. It seems improbable that sandstones so rich in $K_2O$ could have been derived from a source in which K-feldspar was almost absent, and in which untwinned albite was abundant. It is concluded that most of the untwinned feldspar grains were originally K-feldspar or perthite which has been altered during diagenesis to albite.

# SOME SULPHIDE–DIABASE RELATIONSHIPS IN ONTARIO AND QUEBEC

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Detailed investigation of the diabase-sulphide contact relationships at Horne, Quemont, Normetal, Willroy, and Mattagami reveals some unequivocal evidence of thermal metamorphism of the sulphide bodies and reciprocal effects on the diabase. These include local but intensive redistribution of the sulphides and re-equilibration among what were originally stable mineral assemblages.

These imprints are recognizable in different degrees, depending primarily on the time relationships between intrusion and regional metamorphism and on the tectonic level being considered. Cumulative evidence from all these areas suggests a general pattern of events comprising an early stage of dissociation of the adjacent sulphides and a complementary sulphurization of the diabase; the advancing heat front presumably left behind a somewhat porous region and thereby established a pressure gradient towards the diabase that would account for the late-stage resulphurization of the dissociated region and the migration of mobile materials towards the "hot-wall". This thesis is strongly corroborated by the following observations: dissociation of primary pyrite to pyrrhotite and/or magnetite at the contact; subsequent growth of a second generation of pyrite from pyrrhotite and ferromagnesian silicates; development of a chalcopyrite-rich zone near the contact followed by a pyrite-rich zone outwards; increase in the monoclinicity of pyrrhotite towards the contact; abundant development of reaction rims between sulphide–sulphide and sulphide–silicates; and development of pyrite within the diabase at the expense of magnetite and/or ferromagnesian silicates with concommitant release of $TiO_2$. Dissociation, plastic flowage, recrystallization, volatile transfer, and diffusion are inferred to have been the most important mechanisms of reconstitution.

Concentration of chalcopyrite of economic grade within the N–S diabase at the Horne mine is believed due to the combined effects of diffusion, plastic flowage, xenolithic incorporation, and a post-consolidation low-temperature solution activity across the border. The last-mentioned factor was seemingly responsible also for galena-marcasite-carbonate-ZnS polytype veins within the same diabase.