

**CONTACT METAMORPHISM AND FLUID-ROCK-INTERACTION
IN THE EASTERN MONZONI CONTACT AUREOLE;
THE GARDENA SANDSTONE FORMATION**

von

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Abstract

The Monzoni intrusive in the centre of the western dolomites is composed of intermediate to basic plutonites and intruded into the Permo-Triassic sedimentary country rocks at middle Triassic age (217 - 230 Ma). The Gardena sandstone formation is characterised by terrigenous and fluvialite influenced sediments and the carbonate content increases in the upper layers. A result of the contact metamorphic overprint is the formation of new mineral assemblages. On the one hand, the nature of contact metamorphic mineral parageneses is mainly a function of the rock chemistry of the unmetamorphic sediments. On the other hand the newly formed mineral phases are influenced by the input of an aqueous fluid from an external source. Furthermore the composition of the fluid was determined by devolatilization reactions.

In this work petrographic methods were mainly used for the description of the contact metamorphic overprint and associated fluid - rock - interaction. In addition it was possible to use isotopic methods in order to decipher the role of the fluid phase in the carbonate layers.

In the predominately siliciclastic layers of the Gardena formation no new minerals were built, but it could be shown that grain boundary area reduction and static recrystallization of quartz occurred. In the carbonate layers and in carbonate concretion, however, many new minerals were formed with differences in successive mineral assemblages.

In the carbonate concretion a decrease in the O isotopic value is seen, with decreasing distance from the intrusive contact, which indicates an increased external fluid flow along the banded hornfels layers of the Gardena formation. The C isotopes were also slightly decreased by Rayleigh fractionation associated with decarbonatization reactions.

The Gardena sandstone formation is not exposed at the direct contact because of a debris cover. Therefore temperature estimates can only be given from a minimum distance of 160 meters. At this distance the temperature is estimated at 805°K.