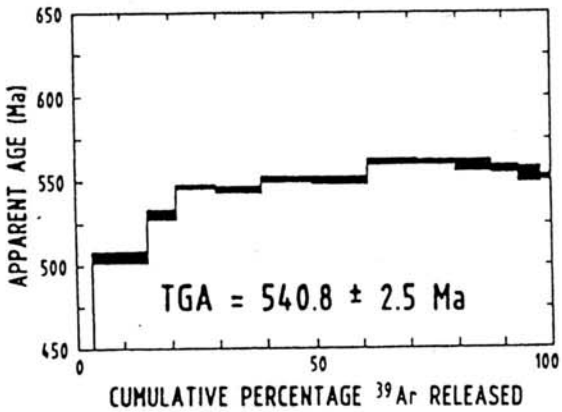

Fig. 2. $^{40}Ar/^{39}Ar$ release spectrum of a detrital muscovite from the Hochrindl Formation.

The enrichment of elements like V, Cr, Ni, and Sc is interpreted to reflect mafic input which is superimposed on a mature continental source (Fig.1). The $^{40}Ar/^{39}Ar$ release spectrum of a detrital muscovite displays an internally discordant pattern with model ages at c. 560 Ma of high temperature experimental increments and low temperature increments decreasing to c. 300 Ma (Fig. 2). We interpret this pattern to reflect post-metamorphic cooling after a Cadomian tectonothermal event within the source region and an in-situ overprint by a Variscan metamorphism after sandstone deposition.

The succession of highly explosive bimodal volcanic sequences and the composition of metasediments are interpreted to represent a continental syn-rift association formed during break-up of continental pieces along northern margins of Gondwana.

Reference
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AN APPROACH TO THE ORIGIN AND EVOLUTION OF MAGMAS IN LATE OROGENIC COLLAPSE BASINS - AN EXAMPLE FROM THE SAAR-NAHE-BASIN (SW-GERMANY)

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The late stage of continent-continent collisions is characterized by the formation of intermontane basins, a high heat flow, and a typical bimodal (basic/silicic) volcanism. The Saar-Nahe-Basin is a Variscan example of such a late orogenic collapse basin which contains basic/intermediate to silicic volcanic rocks. The distribution of the volcanic rocks in the SaarNahe-Basin does not show two distinct maxima of basalts and rhyolites as expected in a typical bimodal suite. However, there are many transitional intermediate rocks between both end members. O-isotope data from mineral separates in combination with trace element data of selected volcanic rocks are presented. These data are used to evaluate the origin and evolution of the volcanic rocks. Simple mixing calculations give first approximations to quantify the relative portions of crust and mantle during magma genesis.

In the Saar-Nahe-Basin the basaltic andesites are probably the result of partial melting of the upper mantle. The origin of the silicic rocks (rhyolites) is not yet clear: They can either be differentiated from a mantle derived magma or be a product of partial melting of the lower/middle crust. The intermediate, mainly dacitic rocks are probably a product of magma mixing which is supported by rounded to cauliflower-shaped basaltic inclusions within rhyolithic rocks and pseudomorphoses of amphiboles and pyroxenes.

Flow texture maps of the Donnersberg and the Lemberg show that both intrusions are composed of several partial intrusions. The Donnersberg, for example, consists of at least 15 partial intrusions. On the basis of these flow texture maps and a detailed grid of XRF-data contour maps are created to indicate spatial variations of specific elements across the intrusions. It is also possible to show the chemical influence of wall rock or adjacent sediments on the volcanic intrusions.