22 Emerald dating through $^{40}Ar/^{39}Ar$ step-heating and laser spot analysis

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Direct K-Ar dating of beryl and emerald appears difficult because of the large amounts of excess argon occupying mainly the hexagonal channels. Combined step heating and spot fusion $^{40}Ar/^{39}Ar$ analysis on individual syngenetic phlogopite and muscovite grains with a continuous laser probe allow to resolve this problem.

(1) Brazilian emerald: Phlogopites associated with emerald from the Carnaíba deposit (Bahia State, Brazil) are dated through (1) step heating analysis of bulk samples and single grains and (2) spot fusion experiments performed on syngenetic solid inclusions precipitated along growing zones of the emerald host crystals. Plateau ages of 1926 ± 8 Ma (single grain), 1942 ± 8 Ma (bulk sample; Braúlia) and 1951 ± 8 Ma (single grain; Trecho Velho) were obtained on phlogopites around the emerald. Similar (but more scattered) ages were obtained by spot fusion on minute phlogopite inclusions inside the beryl, in spite of huge amounts of excess 4 detected in the emerald host crystal. These definitively set the genesis of the Carnaíba em occurrences during the Transamazo tectonothermal event (2100-1800 Ma).

(2) Colombian emerald. Two emerald dep (Muzo-Quipama and Coscuez) from the we emerald belt have been dated for the first time laser probe step heating and spot fusion $^{40}Ar/^{3}$ analysis on synchronous greenish V-Cr muscovite aggregates. Two disctinct ages have obtained at respectively 31.5-32.6 Ma for M Quipama and 35-38 for Coscuez. These ages con the pressure (1.12-1.06 kb) and temperatur formation (290-360°C) of the Colombian emerald

Seventh meeting of the European Union of Geosciences

April 4-8th 1993 Strasbourg

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16 SEPT. 1994