FISSION TRACK THERMOCHRONOLOGY APPLIED IN DETRITAL ZIRCON GRAINS FROM THE BARREIRAS GROUP: EVIDENCES OF A PHANEROZOIC THERMAL EVOLUTION

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ABSTRACT: Zircon is a common accessory mineral in igneous, sedimentary, and metamorphic. It is physically and chemically resistant and can "survive" for many geological periods, and in many cases, provides a record of each geological event which was submitted in these periods. Incorporates in its structure trace elements such as U, Th and Pb, which is crucial for geochronological analyzes. Its ability to retain information about the thermal history of a source area is of invaluable value to elucidate the geological processes arising from a variety of geodynamic settings. Consequently, Zircon Fission Track Thermochronology (ZFTT) has been extensively used in combination with other methods of radiometric dating, such as U-Pb and U-Th/He to understand the geo and thermochronology of rocks in a variety geological environment: orogenic basement rocks, thermochronology using detrital grains in sedimentary rocks for analysis of provenance and thermal history analysis. In this work are presented FFT results to Barreiras Group in the Campos Basin to help understand the evolution of the region adjacent to the continental margin in the southeast, especially the distribution of the source rocks of the detrital sediments. The low temperature thermochronological analysis may provide information on the development of the Brazilian continental margin, such as the formation of the Mantiqueira and Serra do Mar ranges, the interior basins and the oil systems of the margin basins. Fission track ages in the detrital zircon grains occur in four main groups, between (1) 171 and 270 Ma (32%), (2) 274 and 351 Ma (19%), (3) 358 and 429 Ma (14%), and (4) 127 and 167 Ma (12%). Minor fission track age groups occur between 71 and 118 Ma (9%), 433 and 494 Ma (8%), and 502 and 534 Ma (5%). Complex variation in the detrital zircon fission track ages are related to the continental crust thermal evolution in the source areas. Older ages, between 534 and 433 Ma (Cambrian to Silurian periods) are attributed to post-orogenic processes after Gondwana Supercontinent agglutination and are related to the formation of the intracontinental basins within Gondwana paleoplate (Paraná, Congo, Parnaíba, Amazonas and Solimões basins). Fission track ages between 429 and 274 Ma (Silurian to Permian periods) are related to the formation of the Pangea Supercontinent; whereas the main fission track age group, between 270 and 171 Ma (Permian to Jurassic periods), is related to orogenies in Gondwana Supercontinent west margin and Pangea Supercontinent break-up. Fission track ages from 167 to 127 Ma are related to opening of the North and South Atlantic Ocean, and younger ages are related to rifting processes in the South American Platform.

KEYWORDS: FISSION TRACK THERMOCHRONOLOGY; BARREIRAS GROUP; PHANEROZOIC.