

**2 2****THERMAL HISTORY OF THE SINDONG GROUP, GYEONGSANG BASIN  
BASED ON APATITE AND ZIRCON FISSION-TRACK ANALYSES**

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Sixteen sandstone samples from the Cretaceous Sindong Group were analyzed to reconstruct the thermal history using apatite and zircon fission-track analyses. All apatite fission-track ages show a good agreement at around 60 Ma with narrow and unimodal age population, and they are much younger than their depositional ages. This result suggests that all samples had been heated over the apatite partial annealing zone (APAZ, ~70 to 125 °C). Their peak ages (ca. 60 Ma) are, therefore, cooling ages after total resetting, and the timing of thermal event should be older than these peak ages.

The central ages of zircon grains show a wide range from  $83 \pm 5$  to  $157 \pm 18$  Ma, and zircon single-grain age spectra have multi-component age populations. The youngest peak ages, ranging from ~90 to 80 Ma, are younger than the depositional age. Co-existence of both older and younger ages compared with the depositional age indicates that the Sindong Group zircons were partially annealed. It is also supported by zircon fission-track length data, such as distribution patterns, mean lengths and standard deviations.

The timing and magnitude of the paleothermal event can be constrained by the apatite and zircon fission-track data, especially the youngest zircon peak age and apatite cooling age. The Sindong Group was heated into the zircon partial annealing zone (ZPAZ, ~210 to 310 °C) around ~80 Ma, and cooled below the APAZ at ca. 60 Ma. The maximum paleotemperature of the Sindong Group is thought to be close to the top part of ZPAZ. The average heating rate is calculated 4.2 °C/my during 125 to 80 Ma, while the cooling rates are estimated 5.5 °C/my and 1.3 °C/my during 80-60 Ma and 60 Ma to present, respectively. The Sindong Group was heated as a result of burial with strong thermal influence from Late Cretaceous intrusive rocks.