

Abstract: "Natural etching", a hypothetical phenomenon that fission tracks on external mineral surfaces are etched under natural conditions, was investigated. Zircon crystals were kept at 225°C for 480 hours (20 days) in a high pressure bomb filled with NaCl solution, HCl solution or three kinds of spring water. Fission tracks on external surfaces were fixed as defects which could not be faded by annealing. "Track fixation" is defined as etching or alteration of only the damaged region. Taking into account the track fixation, we can explain the difference in fission track ages between internal and external surfaces of zircon from a geological sample that had been subjected to hydrothermal alteration. In that case, we could know the formation and alteration (thermal event) ages of the sample on external and internal surfaces of the naturally track-fixed or -etched zircon, respectively.