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Determination of the Uranium Containing Particles from Swipe Samples by a Fission Track Method

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Analysing micrometer-size uranium containing particles is a powerful tool to verify the undeclared nuclear activity or undeclared facility, and is also applied in the nuclear forensic field. CAEP has developed this kind of analysis technique. Fission track is an effective method to identify the uranium containing particles from swipe sample. During the research, the particles were extracted from swipe cotton by muffle with 400℃ and deposited on the polycarbonate disk which was used to be detector. Then a small piece of polycarbonate was dissolved by 1,2-dichloroethanae. This liquid were dropped on the track-detector by pipette and formed a film with a few micrometer thickness covering all particles. The particles and detector became a whole. After thermal neutron irradiation, the track detector with particles was etched with KOH solution. Under the microscope the tracks from uranium have been observed clearly. The particles componding to tracks were identified to be uranium containing particles. Compared with the conditional FT method (e.g. collodion), this technique has some advantages such as sample manipulation, no separation between particles and FT detector and so on, Importantly, the uranium containing particles can be determined precisely without location.

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