

Abstract Submitted
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UV and Heating Effects on CR-39 Etch Parameters with Spectral Analysis of CR-39 in the UV-Vis-NIR CHRISTOPHER MCLAUHLIN, KENNETH DODGE, JAMES MCLEAN, STEPHEN PADALINO, State University of New York at Geneseo, MICHELLE BURKE, CRAIG SANGSTER, Laboratory of Laser Energetics at the University of Rochester — CR-39 plastic is a common ion detector used in nuclear experiments. High-energy charged particles leave tracks of chemical damage along their path, which form pits when etched with NaOH. It has been found that exposure to UV light after ion exposure enhances the etch rate in both the bulk material as well as along the latent track while maintaining a constant track-to-bulk etch rate ratio. The addition of heat was found to dramatically increase the etch rates by a factor of five, although at higher temperatures pits became irregular in shape. The spectral reflection and transmission of CR-39 for wavelengths between 200nm and 2500nm for various thicknesses of plastic were measured. Using an exponential decay model for absorption the decay depth was calculated from the gathered data. CR-39 was found to be nearly transparent for light between 400nm to 1100nm while strong absorption was present for UV light shorter than 400nm. The reflection of CR-39 was found to be relatively constant averaging at 7%. An anomalous dispersion feature was found centered at 290nm.

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