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Examination of effects of ultraviolet radiation and hydrolysis on Kevlar-49 using Raman spectroscopy

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The effects of environmental degradation on polymer matrix composites is an area of concern for researchers and engineers, as these materials are subjected to high stress environments. As a result of this, a need for nondestructive evaluation of such materials exists. This project looks at the aramid fiber Kevlar 49, which is used in aerospace applications where high tensile strength is crucial. The nondestructive method being evaluated is Raman spectroscopy, which has been shown to reveal a consistent spectrum for Kevlar 49, with distinct peaks characterizing specific intermolecular bonding. Of interest are the effects of ultraviolet radiation and hydrolysis on the Raman spectrum of Kevlar.