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Vacuum ultraviolet spectroscopy of calcium fluoride crystals

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Abstract content (Max 300 words)Formatting & Special chars

In this project experimental setups and techniques for measuring the absorption and excitation spectra of pure and lead (Pb) doped calcium fluoride (CaF_2) crystal samples in the vacuum ultraviolet (VUV) spectral range are developed. This study is conducted using tuneable vacuum ultraviolet (VUV) laser light with a narrow spectral bandwidth generated by a 3rd order nonlinear optical process. This is the first spectroscopic study of an alkaline fluoride using tuneable VUV laser radiation and therefore of strategic importance. This spectroscopic study should yield a more complete spectral characterization of the doped and pure CaF_2 which will contribute to the understanding of the different types of defects, their energy levels and formation mechanisms. As first step absorption measurements over the spectral range 115-180 nm have been obtain using a vacuum scanning (McPherson model 225) with a deuterium lamp (McPherson model 632). Our results show that total absorption of the VUV light by CaF_2 can be observed in 115-126 nm range. The observed absorption features in the 126-180 nm range vary in different samples and correlate with information from the supplier. In addition, the effect of vacuum and gas purged conditions and the stray light background in the monochromator have been determined.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD)?

MSc

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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