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6.5 Study of the acid phthalates (011), $l < 10$, crystal reflections for quantitative spectroscopic studies

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Acid phthalates crystals such as KAP crystals are the method of choice to record x-ray spectra in the soft x-ray regime ($E \sim 1\text{keV}$) using the large (001) $2d=26.63\text{\AA}$ spacing. Burkhalter et al., J. Appl. Phys., 1981, showed that (013) reflection is about or more reflective as the 2nd order reflection (002) and can even overlap the main first order reflection when the crystal b-axis is contained in the dispersion plane, thus contaminating the main (001) measurement. In general, (011) $l \leq 10$, reflections have comparable reflectivity as their respective (00l) counterparts and coincides with the (001) reflection at the limit of l large. We studied the (011) reflection when the crystal b-axis is parallel and perpendicular to the dispersion plane for different spectral ranges. We discuss the effect of contamination of these reflections and potential applications for quantitative spectroscopy. ++ Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia LLC, a wholly owned subsidiary of Honeywell International Inc. for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

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