SIMULTANEOUS XRF/XRD WITH LOW-POWER X-RAY TUBES

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A breadboard instrument has been constructed is that capable of capturing both x-ray diffraction (XRD) and x-ray fluorescence (XRF) information simultaneously using a charge-coupled device (CCD) as the x-ray detector. NASA is funding the instrument's construction because of its capabilities and potential small size; it could be used for in-situ missions for analysis of rocks. A powdered sample of material is placed in front of the CCD, which in turn is bombarded by a collimated x-ray beam. The original source used for the breadboard instrument was a high-power Rikaku RU-200 rotating anode source. In order for the XRF/XRD instrument to be compact and portable, a small low-power source of x-rays is required. We will examine the instrument with a low-power commercial tube and a small prototype field-emission tube being constructed at MOXTEK.