

## **XRD studies of the lattice parameters change, caused by the crystal defects.**

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**Abstract:** Formation of any kinds of crystal defects is followed by creation of mechanical stresses within the crystal structure, which in turn causes lattice parameters to change, these changes result a relevant displacement of the X-ray diffractogram peaks. In this work relative displacement of a certain peak (111) of defected and annealed samples of Al and Cu have been studied using an X-ray diffractometer, controlled and assisted by a high capable computer program. These facilities provide a high resolution for determination of peak's position on the diffractogram so that the relative displacement of a certain peak, relevant to the defected and annealed samples was obtained with precision better than  $\sim 0.01 \text{ \AA}$ . This study shows the reliability of our XRD high resolution method for various applications in the material research fields. As an example of its applications, using the results of this work, the amount of residual stresses in these samples have been determined.

**Key Words:** *residual stresses, crystal defects*