s13.m37.p9 **Structure Characterization of Bulk Single Crystals Using X-Ray Back Reflection Methods.** Hui Zhang[a,b] and Peter Paufler[a], [a]*Institute of Structure Physics, Dresden University of Technology, 01062 Dresden, Germany,* [b]*Max Planck Institute for Chemical Physics of Solids, Noethnitzer Str. 40, 01087 Dresden, Germany. E-mail: paufler@physik.tu-dresden.de*

Keywords: Laue back reflection method; Kossel method; NiAl

A non-destructive procedure, namely determining lattice parameter from back reflection Kossel pattern and collecting intensity data from back reflection Laue pattern, is established to characterise the structure of bulk single crystals. This enabled structure refinement prior to and after plastic deformation of NiAl and Fe-doped NiAl(Fe) single crystals to be performed without destroying the specimens during the preparation of conventional samples for X-ray structure analysis. The key to this approach lies in the natural integration of the two single crystal X-ray diffraction methods, that is the Kossel and Laue patterns may be simultaneously recorded by one single exposure using white X-rays as primary radiation beam.[1]. Further associated with hydrostatic weighing to determine mass density and electron probe microanalysis to monitor chemical composition, the approach is applied to refine the structure of NiAl single crystals in order to identify changes of the occupancy factors of Ni and Al sites in the unit cell of non-stoichiometric samples due to plastic deformation [2,3]. The structure refinement is in favour of the triple defect structure model, but indicates the existence of Ni-site antistructure defects in Al-rich ß-NiAl(Fe). It also suggests that a higher vacancy concentration is retained in Al-deficient β-NiAl(Fe) after high temperature creep tests. Vacancies are likely located on Ni sites [4].

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s13.m37.p10 **Structure and Optical Investigation of the Effect of Laser Radiation in Stabilized Poly (Vinyl Chloride).** S. A. Nouh[a], M. M. Radwan[b], A. S. Abdel-Naby[c], W. R. Agami[a] and M. Morsy[a], [a]*Physics Department, Faculty of Science, Ain Shams University, Cairo, Egypt,* [b]*Physics Department, Faculty of Engineering in Fayoum, Cairo University, Egypt,* [c]*Chemistry Department, Faculty of Science in Fayoum, Cairo University, Egypt. E-mail: mustafaradwan@hotmail.com*

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Structure and optical property studies using IR & UV spectroscopy, refractive index measurement and X-ray diffraction were performed on poly (vinyl chloride), PVC, stabilized by para-ethyl carboxy N-phenyl maleimide (PEC-NPMI) additive. The effect of addition of the stabilizer PEC-NPMI, with different concentrations, was studied. The results indicate that the addition of PEC-NPMI with 0.01 g/1 g PVC enhances the isotropic nature of the PVC polymer. Furthermore the effect of laser radiation on the optical properties of the 0.01 g PEC-NPMI/1 g PVC polymer was studied. The study shows that the PVC stabilized with 0.01 g PEC-NPMI/1 g PVC and irradiated with 4.27 J/cm^2 infrared laser radiation is most suitable for applications requiring PVC of high absorbance value in the IR and UV regions.