



EUROPEAN COMMISSION
JOINT RESEARCH CENTRE
Institute for Transuranium Elements (Karlsruhe)

0912-T20

Proposals for TRAINEE

Title	<i>Studies of phosphate compounds under high pressure</i>
Description	<p>Phosphate compounds like orthophosphate (i.e. AnPO_4), pyrophosphates (i.e. AnP_2O_7) or Phosphate-diphosphate (i.e. $\text{An}_4(\text{PO}_4)_4\text{P}_2\text{O}_7$) show a wide variety of crystallographic structures depending of the oxidation state, radius and coordination of the actinide ($\text{An} = \text{Np}, \text{Pu}, \text{Am}$). We are interested to study those materials up to very high pressure (50 GPa) to establish the effect of pressures on coordination and possible phase changes, as well as to determine their compressibility coefficient.</p> <p>The work will be performed with a rotating anode X-ray source mounted with an APEX II CCD Detector and associated high-pressure diamond cells and equipment. The student will be offered the possibility to study different phosphate compounds in order to determine their bulk modulus and structure under high pressure. The data analysis will be performed primarily by the Rietveld method.</p>
Duration of the traineeship	3 months to 12 months
Required skills or qualifications	<i>Solid state chemistry, X-ray diffraction</i>