



2019-KRU-G-000-010924

**Study of the diffusion behaviour of  
Molybdenum and Caesium in UO<sub>2</sub> and  
UO<sub>2</sub>+x**

<p><b>Position for:</b></p> <p>Trainee</p>	<p><b><u>Short description of activity:</u></b></p> <p>As the science and knowledge service of the Commission, the mission of DG Joint Research Centre is to support EU policies with independent evidence throughout the whole policy cycle.</p> <p>The JRC is located in 5 Member States (Belgium, Germany, Italy, the Netherlands and Spain). Further information is available at: <a href="https://ec.europa.eu/jrc/en">https://ec.europa.eu/jrc/en</a></p> <p>A traineeship is proposed to investigate the behaviour of molybdenum and caesium in nuclear fuel. The safe operation of Light Water Reactor fuel requires a good understanding of the fission product behaviour especially in abnormal conditions or accidental conditions. To predict the behaviour of some specific fission products (FPs) of concern (Mo, Cs) single effect studies on ion implanted samples with controlled concentration and distribution of Mo and Cs will be performed. To compare normal and incidental conditions UO<sub>2</sub> and UO<sub>2</sub>+x samples have been synthesized and implanted. The diffusion of these elements and their possible interactions at high temperature will be investigated by thermal desorption spectrometry and by cross-sectional transmission electron microscopy at different temperature steps. Diffusion coefficient and mechanisms of the single species Mo and Cs in UO<sub>2</sub> and UO<sub>2</sub>+x will be assessed.</p> <p><b><u>Qualifications:</u></b></p> <p>Degree in physics or chemistry. Knowledge on mass-spectrometry, X-ray analyses, RAMAN spectrometry, electron microscopy but also molecular dynamic calculations will be an asset.</p> <p><b><u>For general eligibility requirements, please read the rules governing the traineeship scheme of the JRC:</u></b></p> <p><a href="https://ec.europa.eu/jrc/en/working-with-us/jobs/temporary-positions/jrc-trainees">https://ec.europa.eu/jrc/en/working-with-us/jobs/temporary-positions/jrc-trainees</a></p>
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<b>Institute Unit</b>	Directorate for Nuclear Safety and Security (Karlsruhe) JRC.G.I.3 Nuclear Fuel Safety Unit  Further information: <a href="https://ec.europa.eu/jrc/en/about/organisation">https://ec.europa.eu/jrc/en/about/organisation</a>  <a href="https://ec.europa.eu/jrc/en/science-area/nuclear-safety-and-security">https://ec.europa.eu/jrc/en/science-area/nuclear-safety-and-security</a>
<b>Indicative duration</b>	5 months
<b>Preferred starting date</b>	early 2019
<b>JRC Site</b>	Karlsruhe
<b>Country</b>	Germany
<b><u>JRC contact details</u></b>	<b>For any technical problems with your application, please contact:</b> <a href="mailto:HR-AMC8-RECRUITMENT-TOOLS-SUPPORT@ec.europa.eu">HR-AMC8-RECRUITMENT-TOOLS-SUPPORT@ec.europa.eu</a>