

Training Opportunity for Portuguese Trainees

Reference	Specialist Area	Duty Station
PT-2010-TEC-QEM(2)	Advanced Space Simulation (toxicity/cleanliness)	ESTEC
<p><u>Overview of the Division missions:</u></p>		
<p>The Materials and Components Space Evaluation Division in the Product Assurance and Safety Department of the ESA Directorate of Technical and Quality Management is responsible for the evaluation and qualification of non-metallic materials, processes and Electronic, Electrical and Electromechanical components for space flight applications. This includes the direct technical support of ESA projects and technology programmes for all related product assurance tasks and includes standardization, research and development activities to determine the suitability and reliability of materials and components to withstand the influences of the space environment.</p>		
<p><u>Overview of the field of activity proposed:</u></p>		
<p>Title Validation of contamination/toxicity analysis method for ultra-clean surfaces</p>		
<p>Overview of the field of activity proposed Contamination analysis is traditionally quantified by Fourier transformed infrared spectroscopy (FTIR), leading to semi-quantitative information by direct analysis down to 20-30 ng. For even higher cleanliness levels in the order of ng, e.g. required for advanced scientific payloads (e.g. EXOMARS), more sensitive analytical techniques need to be applied. By gas chromatography/mass spectroscopy (GC/MS) the ng level can in principle be reached, however, the error of analysis is significantly depending on response factors of different molecules. The very broad chemical variety of potential surface contaminants makes a precise quantitative calibration not viable, but following a semi-quantitative approach by grouping different species by chemical similarity, should bring the accuracy of the method to comparable levels as for the traditional infrared method. The activity is focusing on semi-quantitative calibration of contamination via GC/MS, validation of with defined calibration standards, and comparison to conventional infrared analysis.</p>		
<p><u>Required Education:</u></p>		
<p>University degree or equivalent in chemistry or materials science, previous practical experience with analytical techniques such as FTIR and GC/MS is an asset.</p>		