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## Activity report GIG Katowice

I am Jannes Torfs, a master's student in industrial engineering. For my thesis about Liquid Scintillation Counting (LSC), I spent five days at the Central Mining Institute in Katowice to deepen my understanding of the subject. Izabela Chmielewska served as my guide during my stay.

On Monday, I was introduced to the group and given a tour of the institute, which included a visit to the gamma spectrometry lab where they have four gamma detectors, the dosimetry lab where measurements for gamma, beta, alpha, and neutrons can be done, and the lab where radon measurements in air are performed. After a theoretical lesson on the first steps involved in preparing water samples for radium determination with LSC, we proceeded to the lab to put it into practice.

Tuesday started with another theoretical lesson on the next steps, followed by hands-on execution in the lab, including the decantation and centrifugation of the precipitation and the addition of EDTA.

Wednesday began with a lecture on radon in houses, covering how it moves through soil into houses and the different amounts and concentrations depending on soil type and floor level. This was followed by information on the following steps in the lab and further practice.

Thursday brought information on how to determine lead-210 concentration in water and the sampling process for determining radon concentration with LSC. Additionally, I learned that GIG offers a sampling kit that can be sent to others to collect samples for analysis.

To take samples for radon determination in water using LSC, it's important to let the water flow for 10-15 minutes and fill a large container. A 10ml sample is then taken with an eyedropper and added to a vial containing 10ml of scintillation cocktail.

On the final day, I received practical information on LSC and had the opportunity to ask questions. We also revisited the sampling process and examined the different LSC machines, including differences in software and performance between the Tri-Carb and Quantulus machines. I was also shown how alpha beta discrimination works in LSC and how standards are used.

Overall, I had an incredibly enriching experience during my stay at the Central Mining Institute in Katowice. I was impressed by the level of expertise and professionalism of the staff there, especially my guide, Izabela Chmielewska. The hands-on experience I gained in the labs and the theoretical lessons I received have been invaluable for my thesis research on LSC.

Moreover, I must say that I was delighted with the warm and welcoming attitude of everyone I met there. They were all very kind and helpful, always willing to answer my questions and assist me with any concerns. I truly enjoyed my time at the institute and would highly recommend it to anyone interested in this field of study.