Results of a supranational Round Robin Test to initiate an international standard for source-based PALS measurement

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The source-based positron annihilation lifetime spectroscopy (PALS) represents a very sensitive method to characterize open volumes / open volume defects on an atomic scale for a broad range of material classes such as metals, semiconductors, polymers and porous materials. Even though PALS has been established in the early 1960's, there exists up to now no standardization for measurement and analysis of the data. This leads to a significant lack of reliability in comparison to other methods used for the characterization of material properties.
In the aim to establish an international standard, several positron research groups in Europe conducted a Round Robin Test on a collection of nine well-known bulk materials (polymers, metals, semiconductors). All materials were shipped between the participants to ensure the best possible comparability. The kind of setup and the applied configurations have been documented. The correctness of the measurement procedures and software/algorithms used for data analysis has been tested.
A first draft of a standardized measurement procedure including a documentation form for the analysis were used to ensure that every participant does follow the process of the source-based PALS measurement.
Our suggested protocol is the first step towards an international norm for PALS measurements. A standardized documentation could help the positron community to reach a higher level of transparency, reproducibility and reliability and it would improve the comparability of PALS results obtained from different research groups. Furthermore, if the community agrees on a standard measurement procedure, it would increase the impact of any positron publication.

Our poster will give an overview of the results of the conducted round robin test. We will present the draft of a measurement and analysis template/form.
By this poster, we would like to provide a platform for all scientists in the field to discuss the idea of an international standard for PALS measurement. We invite all positron experts to discuss this idea to clarify, if it is possible and/or necessary to create such a norm.

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