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Characterization and harmonization for industrial standardization of advanced materials studied by Raman spectroscopy – The H2020 CHARISMA project

Raman spectroscopy is becoming a key technology used in research and development for characterization of materials. As such, any spectrum should be reliably comparable with any other and linked to specific material properties. However, in real life, Raman spectra can differ between instruments and depend on the spectrometer, optical path or sample environment, among others, and only a limited number of calibration standards for Raman spectroscopy are available to date [1].

The aim of H2020 CHARISMA project [2] is to develop new concepts to harmonize Raman spectroscopy for characterization across the life cycle of a material, from the product design and manufacture to lifetime performance and end-of-life stage. The main objectives are: development and production of universal, robust and readily available calibration standards and protocols for spectra acquisition and data analysis and storage; harmonization of raw Raman data through conversion to universal and open data format; generation of a FAIR [3] Raman data repository to enable exchange of spectral data between users. The project is based on strong cooperation between academic and industrial partners and is divided into a research-based technical part that will develop and analyze the tools, and the industrial part that will apply them in relevant case studies. It covers both experimental and theoretical Raman spectra generation, interpretation and storage following the FAIR principles. In the long term, CHARISMA aims to make Raman spectroscopy a widespread technology used within the Industry Commons concept.

References

[1] A. Ntziouni et al., Applied Spectroscopy 76 (2022) 747-772

[2] <https://www.h2020charisma.eu/>

[3] <https://www.go-fair.org/fair-principles/>

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