Coated Hollow Capillaries as X-Ray Optics

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Hollow glass capillaries are widely used as X-Ray Optics. State of the art is to use these capillaries uncoated.[1]

In this talk, different selected coating technologies like Chemical Vapour Deposition (CVD) in order to coat even complex hollow glass capillaries[2] are introduced. These different coating methods are discussed intensively for the modification and functionalization of different hollow glass capillaries with High-Z-metals[3] in order to use them as X-Ray Waveguides e.g. for analytical applications like X-Ray Optics for microanalysis. As High-Z-metals mainly d-block transition metals can be used. For this purpose, special organometallic, elementorganic or coordination compounds[4] mainly of d-block transition metals are decomposed chemically in these capillaries. Thus, a specific tailored nanostructured surface for the respective application can be realized to guide even hard X-Rays in these hollow capillaries like optical waveguides. To achieve this objective, the right choice precursor material is highly relevant.

These innovative surface coatings, which alter the properties of the coated materials significantly, can enable the capillaries to boost up their performance for different applications in analytics. The ultimate application of these microstructured capillaries modified and functionalised by e.g. High-Z metals is their use as X-Ray Optics for different analytical applications.

These applications will also be presented and discussed intensively in this talk.

[4] J. Wochnowski et al., Surface-modified structures, useful e.g. in optical or catalytic applications, comprise substrate, e.g. of glass, silicate primary coating and secondary coating, e.g. of metal Patents: DE 102007049930 (A1) 2009-04-23; DE200710049930 20071018; DE 102007049930 (B4) 2011-04-28.