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Defect structures of photocatalytic plasma treated and doped titania

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Titania TiO2 is a promising material candidate for batteries, water splitting and water purification. Its photocatalytical and Li-storage capabilities very much depend on the defect structure in the used titania. Hydrogenation and N-doping have proven to improve this defect structure in such a way that the mentioned properties are drastically improved [1–3].
With the help of nuclear solid state methods like Mössbauer and PAC by using also radioactive isotopes from ISOLDE such defects could be analysed in detail [4–7]. With the support from a BMBF project a new Mössbauer system is generated for ISOLDE with which also the atomic mechanisms responsible for the photocatalytic properties are investigated by Mössbauer spectroscopy, in addition to PAC. First results will be presented.

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