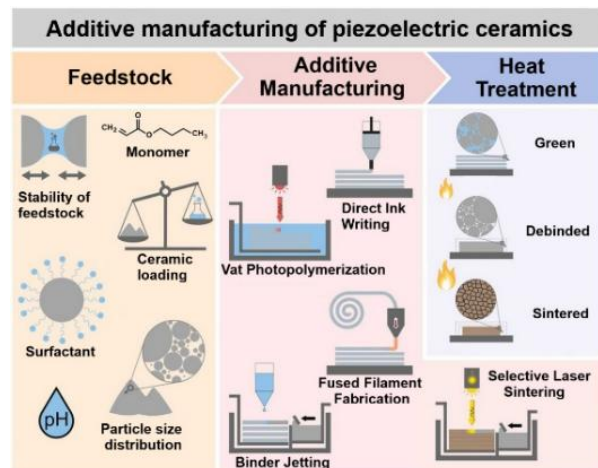


Master's Thesis project – open call (Advanced Materials Science, Technical Chemistry)

Pathways to recycle piezoceramics for use in additive manufacturing

Scientific background

Piezoelectrics are functional materials that enable the interconversion of mechanical and electrical signals and are therefore used in a wide range of modern applications such as sensors, transducers, actuators, power generators, energy harvesters, etc. [1,2]. A rapidly developing technology for their production is additive manufacturing or 3D printing [3]. Compared with traditional processing methods, it allows the production of complex-shaped objects with minimum waste and targeted properties combination.



What we offer

The main goal will be to develop a process for the controlled fragmentation of piezoceramics and to prepare stable, printable piezoceramic suspensions for additive manufacturing via Vat-photopolymerization. Within this thesis, you will get familiar with experimental techniques used for the synthesis and characterization of powders, suspensions and piezoelectric ceramics. In addition, you will gain knowledge on FEM modelling, electroceramic materials and develop skills in microscopy, X-ray diffraction, and electrical measurements of piezoceramics. We offer a financial support of 440 €/month for the time of the thesis, which is planned for 6 months.

Requirements: Ongoing studying programme Advanced Materials Science, Technical Chemistry, or Physics; self-organized and independent way of work, good English skills.

Contact

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References

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- [2] X. Gao *et al.*, Piezoelectric Actuators and Motors: Materials, Designs, and Applications, *Adv. Mater. Technol.* **5**, 1900716 (2020).
- [3] Chen *et al.*, 3D printing of ceramics: A review, *J. Eur. Ceram. Soc.* **39**, 661 (2019)

Image sources: Manufacturing Guide Sweden AB, SpecialChem 2022, Zakeri *et al.*, *Addit. Manuf.* **35** (2020)