High load NCM-622 cathodes based on a solvent-free coating process

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Due to the increasing requirements in terms of energy density and costs of lithium ion cells especially for electromotive applications, new coating concepts are needed. Li-ion battery electrodes normally are manufactured by coating solvent containing slurries on a metallic current collector. The most commonly used solvents are N-Methyl-2-pyrrolidone (NMP) as well as water, while the latter is normally used for anodes.
The drying of the coated electrode slurry is an energy consuming process. It also requires a large available space because of the long drying sections needed for optimal process results. Furthermore, in the case of NMP, a special recovery system of the evaporated solvent is needed.
With a dry coating process as it was developed by Fraunhofer ISIT, the use of solvents is no longer required. This allows significant cost reductions and can also lead to a better environmental sustainability of the manufacturing process.
The BMBF funded project "Umweltfreundliche Hoch-Energie-NCM 622-Kathoden mit optimierter Speicherkapazität/High-Load-Kathoden" (HiLo) which is part of the competence cluster for production of battery cells "ProZell" addresses this issue. Solvent-free processing of electrodes by i.e. atomic laser deposition (ALD) is used for thin film batteries [1] but solvent-free coating of thicker electrodes using dry-spraying techniques, [2,3], is a relatively new topic although it is widely used in paint/lacquer industry. Nevertheless, the electrode thickness achieved so fare is still low if compared to nowadays available high energy electrodes with loadings of above 4 mAh/cm^2. This is basically due to limitations of adhesive properties determined by the applied high voltage electrostatic field.
In this contribution, promising results of manufacturing high load electrodes based on a new solvent-free coating process developed by Fraunhofer ISIT will be presented and a comparison of electrochemical results as well as physical properties between the "classical" and the "new" route is drawn.

References:
[1] C. Guan, J. Wang, Adv. Sci. 3 (2016) 1500405.
[2] D.-W. Park et al., Journal of Power Sources 306 (2016) 758.
[3] B. Ludwig et al., Sci. Rep. 6 (2016) 23150.