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Chemical processes in commercial batteries studied by synchrotron-tomography and 3D image analysis — •A. Rack[1], A. Haibel[1], I. Manke[2], S. Zabler[2], H. Riesemeier[3], G. Weidemann[3], J. Goebbels[3] und J. Banhart[1,2] — [1]Hahn-Meitner-Institut Berlin, Abteilung Strukturforschung, Glienicker Str. 100, 14109 Berlin — [2]Institut für Metallphysik, Hardenbergstr. 36, 10623 Berlin — [3]Bundesanstalt für Materialforschung und -prüfung, Unter den Eichen 87, Haus 60, 12205 Berlin

Batteries are playing a major role in everybody's daylife: laser pointers, walkmen, mobile telephones - all are working with a power pack. Here we are focusing on mangan-zinc batteries (type AAA/micro) as they are widely used and therefore investigations are interesting for all kind of applications. By working with the high resolution tomographic setup of the BAMline @ BESSY II we get 3D images of one battery in different discharging stages. Due to the use of monochromatic radiation we are able to distinguish between the different materials within our tomographic image. All components are separated into Boolean images and then investigated by 3D image analysis methods derived from stochastic geometry [1]! Therefore we can quantify the time-dependent decay of the battery's mangan as well as changes of the zinc powder's morphological structure.

[1] J. Ohser and F. Mücklich, *Statistical Analysis of Microstructures in Materials Science*, John Wiley & Sons, 2000

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