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# Microspherical Cellulose Beads as Support for Immobilization of Lignin degrading Enzymes

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## Abstract

In the waste stream of cellulose producing factories lignin is a main component which is mainly thermal recycled or disposed as a solid. To add a step to the value chain lignin depolymerizing enzymes can be used to break the lignin down to its aromatic monomers. We show how spherical cellulose beads in varying sizes can be synthesized and activated to effectively immobilize Laccases onto the cellulose support. Laccases are capable of degrading lignin and are found in white-rot funghi. The activity of those enzymes is evaluated with ABTS (2,2'-Azino-bis(3-ethylbenzthiazoline-6-sulfonic acid)).The influence of various parameters, such as pH, buffer or reaction time on the immobilization steps are shown. Based on the findings of Wheatley[1] the strong influence of ionic strength is shown on the immobilization process. Furthermore, the stability of these immobilized enzymes is discussed.

## References

1 Wheatley, J. B., Schmidt Jr, D. E.: Salt-induced immobilization of affinity ligands onto epoxide- activated supports. J. Chromatogr. A **849** (1999), 1–12.

**KEYWORDS:**

Cellulose beads
Lignin degradation
Laccase
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**Biography**

M. Sc. Matthias Lang(*1993) started studying chemistry at the TU Dresden in 2012 and got his Bachelors degree in 2015 for his work “cloning and expression of Chitinase D from *Paenibacillus sp. WL-12*”. He received his masters degree for the “synthesis and characterization of hydrogels out of hydroxyethylcellulose sulfates”. As of 2018 he is a scientific assistant at the Institute for plant and wood chemistry at TU Dresden and is doing his PhD in the field of immobilizing enzymes to cellulose particles.