# Online measurement of viscosity for xanthan production in stirred tank reactors.

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Details

**Abstract**

One of the most critical parameters in chemical and biochemical processes is the viscosity of the medium. Its impact on mixing, as well as on mass and energy transfer is substantial. An increase of viscosity with reaction time can be caused by the formation of biopolymers like xanthan or by filamentous growth of microorganisms. In either case the properties of fermentation broth are changing and frequently non-Newtonian behavior are observed, resulting in major challenges for the measurement and control of mixing and mass transfer. This study demonstrates a method for the online determination of the viscosity inside a stirred tank reactor. The presented method is based on online measurement of heat transfer capacity from the bulk medium to the jacket of the reactor. To prove the feasibility of the method, fermentations with the xanthan producing bacterium *Xanthomonas campestris* pv. *campestris* B100 as model system were performed. Excellent correlation between offline measured apparent viscosity and online determined heat transfer capacity were found. The developed tool should be applicable to any other process with formation of biopolymers and filamentous growth. Biotechnol. Bioeng. 2017;114: 990–997. 

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