Raman microspectroscopic analysis of fibers in beverages

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Staining of different cellulose fibers with Rose Bengal

We followed the staining method described by Liebezeit and Liebezeit 1. Shortly, the wet filters were each covered with 6 mL Rose Bengal solution (4,5,6,7-tetrachloro-2′,4′,5′,7′-tetraiodofluorescein, 200 mg/L) for 5 min. Afterwards the filter were thoroughly rinsed with filtered water and dried overnight. Five different 100% cellulose fibers were examined: tissue fibers (Carl Roth GmbH & Co KG, Karlsruhe/DE), blue jeans (H&M, Stockholm/SE), a green t-shirt (fruit of the loom, Bowling Green, Kentucky/US), a white t-shirt (etirel, Heilbronn/DE) and a lab coat (Laborhandel
Krumholz, Selters/DE). Only the tissue fibers showed staining (see figure below), which suggest that this method is not appropriate for fiber discrimination and identification. Therefore, another reliable method e.g. Raman microspectroscopy has to be applied.

Figure SI1: Staining with Rose Bengal. The fibers are shown before (left) and after (the treatment in the corresponding circles. Only the fiber from the tissue sample (E) is stained, the fibers from the white T-shirt (A), the green T-shirt (B), the lab coat (C) and from jeans (D) are unstained though they consist of 100% cellulose.