

The bitumen microstructure: a fluorescent approach

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With the increasing price of bitumen, the demand at the industry regarding quality requirements, longevity and recyclability is constantly rising. Conventional bitumen quality controls are usually done by mechanical tests. The major drawback of these tests is, that they do not reveal any chemical information about the microstructure of bitumen. Hence, a method which grants insight on a molecular level is needed.

Fluorescence spectroscopy fits many of these requirements. The method reveals information about the composition of a sample, the quality of the crude oil source, as well as information regarding the ageing process of the material. By using various scan techniques (emission-, excitation-, and 3D-scans) throughout an ageing process, the chemical change (e.g. oxidation) in the microstructure can be followed and observed. These chemical changes are of great interest for the bitumen industry and will lead to a better fundamental understanding of the ageing process, which might help to gain more control in context of ageing and recyclability.