APPLICATION NOTE

Determination of water content in Scharlau tars derived from coal/petroleum and related substances



Matrix type:

Both matrices, both petroleum tar and coal tar, share a similar chemical composition. They consist mainly of polycyclic organic compounds that form long chains.

Both types of matrices are liquid at room temperature, with variable viscosity and a density at 20 °C ranging between 1.00 and 1.30 g/cm3. The water content typically varies between 1 and 10% by mass.

Other types of matrices evaluated using this technique include tar distillation fractions, particularly oils. These oils have densities between 0.9 and 1.02 g/cm3 and low water content, typically less than 0.5% by mass.

Equipment used (Brand and model):

The equipment used for determining the water content in the aforementioned samples has been a Hanna instrument model HI933 KF.

Sample pre-treatment:

Mechanical homogenization of the sample for proper sample representativity.

Titration procedure:

The titration is carried out through volumetric titration. The amount of sample mass introduced varies depending on the suspected water content, ranging between 0.1 and 0.5 grams. Once the mass is introduced into the titration flask, the pre-analysis stirring time is set at 180 seconds with a stirring speed of 1200 RPMs. The maximum dispensing amount is 100uL, with a dispensing time interval of 3 seconds.

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- Aquagent® Complet 5 is used as the titrant.
- A 50:50 mixture of xylene and dry methanol, prepared in the laboratory, is employed as the reaction _ medium.

Results:

The sample mass introduced in the Karl Fischer equipment.

The water content ranged between 0.04% and 10.6%, with relative standard deviations in the range of 1% to 14% between measurements of 2 replicates.

These tests involved analyzing tars from different sources (petroleum and coal) and oils obtained from their distillation.

The water content differs between the raw material (tar) and the distilled products (oils). Therefore, a smaller amount of sample is used for the raw material (between 0.1 and 0.3 grams), while a larger amount of sample is used for the distilled oils (between 0.7 and 1 grams).

The wise choice