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Programm für lebenslanges Lernen

ŠPŠCH Brno

Developing vocational education concepts for the professional fields of action

"Working in the chemistry laboratory" and "operator"

Applied Chemistry and Food Analysis

LEE3: 2. Determination of dry matter and moisture as a quality indicator in the production of rubber.

Imagine that you are working in Gumotex in OZ3 laboratory for quality, and there you have the daily task of determining the moisture and dry matter in the rubber. This determination is one of the most important laboratory tests, because the moisture and the dry weight is an important parameter for the rubber mixtures dissolved in toluene or benzene. The resulting mixture must comply with the prescribed requirements. For example, if the value of the dry weight would be too low, in the coating of textiles, the mixture piercing could face and that would lead to the depreciation of the product.
The test result then write in the enterprise software or laboratory diary, where the values are requiring the company standard. From the results you determine if the test is satisfied or not. According to the results of the test is then tested rubber mixture for further processing sent (or not sent).

Procedural knowledge Characterization of the work activity		**Factual knowledge Characterization of the working system**	
Work steps	**Skills / abilities**	**scientific contexts**	**technological contexts**
Task: 1) Determine the content of the dry mass in the submitted	- Task Analysis - Planning and organizational skills	The dry matter content is a basic characteristic. The dry mass of the residue obtained by drying the	Determination of dry mass and moisture is one of the provisions set forth in practice most

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sample of rubber. 2) Determine the content of moisture in the submitted sample of rubber.		sample at prescribed temperatures under conditions of the process. The evaporated portion is called the water (or moisture). In the products, there are both free water and bound (for example, to proteins, etc.).	frequently, especially in the rubber industry, food industry, etc. The dry matter or moisture content is a fundamental parameter of product quality. etc. The dry matter content is determined (up to 100 ° C at atmospheric pressure of 101 325 Pa) by drying the sample in the dryer at temperature higher than the boiling point of water.
Utilities: Aluminum containers (weighing bottles dryer, analytical balance, desiccator, laboratory tongs, Laboratory spoon	- Accurate and conscientious work Handling laboratory equipment	**Prerequisite for the determination:** In the desiccator is commonly used as a desiccant of **silica gel**, the granular, porous form of silica having a large adsorption capacity, it is a polar adsorbent. The silica gel is non-toxic, non-flammable and chemically very inert. Sometimes it is supplied with an admixture of moisture indicator which then changes the color when the silica is wet, for example, with cobalt chloride, the blue in a dry state after the binding of water, it is pink.	**Prerequisite for the determination:** **Desiccator** is an apparatus for drying of samples for the storage of hygroscopic substances, etc. It is about a double walled container which is used in the laboratory. The lid has a cut that needs to be lubricated with joint grease. The lower part of the container is separated by a perforated plate (usually porcelain) and filled with a suitable desiccant. As desiccant typically silica or calcium chloride is used. **Dryer** is a device for drying the sample using an elevated

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			temperature, typically at a temperature of 105-110 ° C. Analysis balance means a balance that weighs with accuracy up to 0.1 mg.
Chemicals: sample	- Accurate and conscientious work	**Prerequisite for the determination:** The sample must be homogenized. **Homogenisation of the sample** - is carried out for example by mixing, to ensure that the analyzed sample has the same characteristics as the starting material analyzed.	**Prerequisite for the determination:**
Procedure: ***Determination of dry mass:*** 1 We weigh in the clean and weighed aluminum dish that has been previously dried at 1300C, 10 g of homogenized sample with accuracy of 0.1 mg. 2. We will give the sample on the tray into a drier and dried at 105 ° C to constant weight. 3. result of the test is the average of two parallel determinations carried out (Results may not differ by more than 0.5% absolute value of the dry	- Accurate and conscientious work - Eco-friendly and health-friendly work.	**Prerequisite for the determination:** **Drying to constant weight**. In general, the sample is dried for 1-3 hours, then it is cooled in a desiccator and then weighed. Then the sample is again dried for about 1 hour, and weighed again after cooling in a desiccator until the difference between the two weighings is not more than 1 mg..	**Prerequisite for the determination:** When weighing the sample on an analytical balance must be careful so as not to contaminate the balance.

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mass) **Determination of moisture:** We calculate the moisture in% of the determined dry mass.			
Analysis and calculations: ***Calculation of the dry mass content***: Calculate the dry matter content in weight percent - Aluminum shell weight with the sample - weight of the clean cup = 100% by weight and an aluminum bowl with of the dry mass - weight of clean shell = x% dry mass ***Calculating the moisture content***: 100% -% dry mass =% moisture	- Accurate and conscientious work - Handling laboratory equipment - Eco-friendly and health-friendly work. - calculations		
Conclusion: We give the dry matter content in%. We give the moisture content in%. If possible, we compare the results obtained with the legislation.	- Precise formulation of the results. - Working with legislation	The weight percentage indicates the amount of analyte in the sample of 100 g.	

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