**AGROINDUSTRIAL STRENGTHENING OF QUINOA PROJECT THROUGH THE SCALING OF PROTOTYPES IN RELEVANT ENVIRONMENTS FOR THE INDUSTRY IN THE DEPARTMENT OF CAUCA**

**DETERMINATION OF ETHERAL EXTRACT**

**Guide Code: 002**

**INVESTIGATION GROUP:CYTBIA; ASUBAGROIN; GIPA.**

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Prepared by: Chem. Lina Fernanda Restrepo Buesaquillo

Directed by: Ph.D. Diego Fernando Roa Acosta

1. **AIM**

Quantitatively determine the ethereal extract content of a food by the Soxhlet method.

1. **BASIS**

In the Soxhlet technique, the solubility of the extractable components is performed by dripping cold solvent from a reflux condenser, the time determined by AOAC 991.36 for this technique is 4 hours with the use of an organic solvent at boiling temperature thereof, Table 1 lists the solvents that can be used and the working temperatures.

|  |  |
| --- | --- |
| **SOLVENT** | **TEMPERATURE °C** |
| Diethyl ether | 80-100 |
| Petroleum ether | 120-160 |
| dichloromethane | 100-130 |
| hexane | 140-155 |
| Chloroform | 100-140 |
| Carbon tetrachloride | 120-185 |

**Table 1.**Solvents for soxhlet method.

Consequently, to complete the extraction in the time stipulated by the standard, several hours are necessary.

“In the RANDALL technique, which is used in the SX-6 extraction system, a first extraction phase is carried out by immersion of the sample contained in the cellulose cartridge in the boiling solvent known as (Boiling Phase), followed by a washing by refluxing the solvent (Rinsing Phase).

1. **MATERIALS**

|  |  |
| --- | --- |
| **Material** | **Quantity** |
| 250 mL beaker | 2 |
| 100 mL cylinder | 1 |
| Spatula | 1 |
| soxhlet cartridge | 6 |

1. **REAGENTS**

|  |  |
| --- | --- |
| .Reagent | **Quantity** |
| Petroleum ether | 100 mL for each sample |

1. **TEAMS**

|  |  |
| --- | --- |
| **Team** | **Quantity** |
| soxtest team | 1 |
| Analytical balance | 1 |

1. **PROCESS**

Before starting the process, open the cooling circuit, correctly connecting the water inlet and outlet hoses.

* 1. **Preparation of sample**

The sample must be dehumidified and must have a particle size of less than 1 mm.

* 1. **Reagent preparation**

Does not apply

* 1. **Process**
     1. Initially, the extraction cartridges are purged with the same solvent that is going to be used in the determination for 15 minutes; Once the time is up, the cartridges are taken to a desiccator so that the solvent is completely volatilized for a period of 1 hour.
     2. Weigh 1 g of sample in the extraction cartridges and leave them in the rack with their respective supports.
     3. Weigh the metallic cases and take them to the rack to the extraction chamber for the addition of 80 mL of petroleum ether, the rack is transferred to the soxtest equipment.
     4. Take each of the sample cartridges and insert them into the magnet, once they are inserted, adjust the metal buckets and lower the lever so that they remain in position.
     5. On the control panel, adjust the temperature and time of the boiling, rinsing and recovery phases; start the program by pressing the (start/stop) key for 1 second.
     6. Leave in extraction the time that is programmed.
     7. Once the extraction and solvent recovery time is over, the metal ladles are placed in an oven at 60 °C for 1 hour to remove the remaining ether.
     8. Put the saucepans in the desiccator for 6 hours.
     9. Weigh the metal saucepans and calculate the percentage of ethereal extract in the sample.
* The following image describes the operation of the SOXTEST equipment.

|  |  |
| --- | --- |
|  | 1. Purge cartridges and pans with petroleum ether for 15 minutes |
|  | 1. The cartridges and pans are placed in a desiccator until the ether is completely volatilized. |
|  | 1. Extraction cartridges and metal buckets are weighed. |
|  | 1. Assembly of the RAYPA team. |

* 1. **Calculations and expression of results**

The calculation of the ether extract determination is carried out as follows:

1. **DISPOSAL OF CHEMICAL AND/OR BIOLOGICAL WASTE.**

The ether is recovered in a dry amber flask, for other uses thereof.

In the event that the ether is saturated, final disposal can be made in container number 4, labeled as: ORGANIC SOLVENTS.

**BIBLIOGRAPHY**

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