



Republic of Iraq

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Carbon Residue

BY

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Evening study

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Scope :

- 1- This method covers the procedure for determining the amount of Carbone residue left after evaporation and paralyis of oil.**

- 2- It is intended to provide some indication of relative coke-forming propensity.**

- 3- The method is generally applicable to relatively non- volatile petroleum products which partially decompose on distillation at atmospheric pressure.**



Introduction :

The term "carbon residue" is employed consistently in this testing procedure to indicate the carbonaceous residue produced during the evaporation and pyrolysis of a petroleum product. Although the residue is not entirely composed of carbon, it constitutes a form of coke that can undergo further transformation through pyrolysis.

The determination of the remaining carbon involves subjecting the product oil to high-temperature heating in an air-destructive environment. This process involves the evaporation of volatile substances, as well as the disintegration and cracking of hydrocarbon compounds due to the impact of elevated temperatures. The residual vapors are then isolated, leaving behind carbon. The determination of the remaining carbon is carried out by heating the oil product at high temperatures, excluding it from contact with the air.

During this process, the evaporation of volatile substances occurs, along with the disintegration and cracking of hydrocarbon compounds influenced by high temperatures. The procedure aims to isolate the fumes formed while the trailing carbon is left behind. Standard methods employed for this purpose include:



PROCEDURE :

Set the remaining carbon of the fuel oil in a heavy by (Conradson).

1- Made up of the device placed inside the ceramic bowl vine cans closed

tightly to pay a port side and cover for out fumes and burning and burning

is the use of heating gas.

2- Cleaning porcelain vine well and weighed empty.

3-The weight is taken is known of the form (10) gm in almost porcelain vine and placed inside the device.

3- Heating is by muharraq gradually until it begins to reignite vapors then continue heating until the flame extinguished in its final.

5-The vine placed inside the ceramic pot for a period of drying (20) minutes and then weighed and calculated the percentage to carbon residue

Apparatus :

- **Carbon Residue**



Fig (1) Carbon Residue Apparatus



Discussion :

Interpreting the data in the broader context of petroleum chemistry, the findings align with existing theories regarding the formation and properties of carbon residue. The discussion delves into the implications of the observed transformations, linking them to established knowledge in the field. Any discrepancies or unexpected results are analyzed, and potential sources of error in the experimental setup are considered.

Q: How do the findings align with existing theories?

A: The results align with established theories regarding the formation and properties of carbon residue in petroleum products. The identification of coke as a primary component supports existing knowledge about the transformation of hydrocarbons under specific conditions.

Q: What are the implications of observed transformations?

A: The observed transformations have significant implications for understanding the behavior of petroleum products. They suggest that the composition of carbon residue is dynamic and subject to further change, emphasizing the importance of considering pyrolysis in the analysis of such materials.

Q: Were there any unexpected results, and how are they explained?

A: Unexpected results, if any, are thoroughly examined. Any deviations from anticipated outcomes could be attributed to



experimental conditions, variations in sample composition, or potential errors in the analysis process.

Q: How can these findings contribute to the broader understanding of petroleum chemistry?

A: The findings contribute by providing a nuanced understanding of carbon residue behavior. This knowledge can inform future studies on refining processes, product stability, and environmental impacts associated with petroleum product use.



REFERENCE :

- **ASTM D4530 - Standard Test Method for Determination of Carbon Residue (Micro Method)**
- American Society for Testing and Materials (ASTM)
- **ASTM D189 - Standard Test Method for Conradson Carbon Residue of Petroleum Products .**
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- **Speight, J. G. (2014). The Chemistry and Technology of Petroleum (5th ed.).**
- This comprehensive book covers various aspects of petroleum chemistry and technology, and it may provide additional background on carbon residue in the petroleum industry.
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- This handbook may contain information on the characterization of petroleum products, including carbon residue