University of Anbar

College of Engineering

Chemical & Petrochemical Engineering

Oil properties Laboratory, 3rd stage 2023-2024

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Experiment No. 4:

Carbon Residue

AIM OF THE EXPERIMENTS: To determine the carbon residue of the given sample of lubricating oil/fuel.

APPARATUS REQUIRED:

1. Carbon residue (Conradson) apparatus

2. Analytical balance with Weight box

SAMPLE REQUIRED: Fuel oil

THEORY:

Most of the lubricant oils are containing high percentage of carbon in combined form and fuels containing less percentage of carbon in combined form. On heating, they decompose depositing a certain amount of carbon. The deposition of such carbon in machine is intolerable, particularly in internal combustion engines and air compressors. A good lubricant should deposit least amount of the carbon in use.

PROCEDURE:

1. The weighed porcelain or silica crucible with approximately weight in grams of sample is placed in the center of skid more crucible.

2. The skid more crucible is provided with lid, having a small tube type opening for the escape of volatile matter.

3. The combination is then placed in wrought iron crucible covered with chimney shaped iron hood.

4. The wrought iron crucible is heated slowly till flame appears. Slow heating continues for 5 minutes more.

5. Finally, strong heating is done for about 15 minutes till vapours of all volatile matter are burnt completely.

6. Apparatus is then allowed to cool and weight of residue left is determined.

7. The result is expressed as percentage of the original weight of oil taken.

OBSERVATIONS:

1. Weight of the crucible w1 = gms

2. Weight of the crucible with oil w2 = gms

3. Weight of crucible with residue w3 = gms

$$\text{Percentage of carbon residue} = \frac{weightofresidue}{originalweightofsample}$$

$$= \left[\frac{W_3 - W_1}{W_2 - W_1}\right] \times 100$$

Result and Discussion:

1- What is the percentage of carbon residue?
2- What is the importance of carbon residue?

3- What will be the effect of carbon residue in engine?

4- Where does carbon residue build up?