

Experiment No. 5

Aim of the experiment: To determine Iodine value of given oil sample.

Apparatus required: 250 ml round bottomed flasks, beakers, reflux condenser, Buchner flasks, Buchner funnel, thermometer, separatory funnel, etc.

Chemicals required: Oil sample, potassium hydroxide, ether, ethanol, phenolphthalein.

Principle: The iodine value is the number which expresses in grams the quantity of halogen, calculated as iodine, which is absorbed by 100 gm of substance under the described conditions. It may be determined by any of the following methods. Unsaturated fatty acids can be converted into saturated by the process of hydrogenation. Depending upon the degree of unsaturation, the fatty acids can combine with oxygen or halogens to form saturated fatty acids. So, it is important to know the extent to which a fatty acid is unsaturated. There various methods for determining the unsaturation level of fatty acids, one of them is by determining the are iodine value of fats. Iodine numbers are typically wont to determine the amount of unsaturation in fatty acids. This unsaturation is within the form of double bonds, which react with iodine compounds. The higher the iodine number, the additional C=C bonds are present in the fat.

Procedure

Prepare and titrate a blank solution as below but omit the oil. The blank titration only needs to be done once at the start of the experiment. Accurately weigh 4 g of the oil sample into a clean 400 ml conical flask. Add 15 ml propan-1-ol to the flask and allow the oil to dissolve. Add 20 ml Iodine solution. Add 200 ml cold water (~10°C). Cover with a watch glass and swirl the flask gently for 3-5 minutes. Titrate the solution to a pale yellow colour and then add 2 ml starch solution. Continue titrating to the milky white endpoint ensuring that the flask is well shaken to remove all traces of colour.

Iodine value = $(B-T) \times (0.0127) \times 100/W$