

## Lipid tests

### SUDAN III TEST:

Sudan III is a red fat-soluble dye that is utilized in the identification of the presence of lipids, triglycerides and lipoproteins. Sudan III is a lysochrome (fat-soluble dye) diazo dye. It is structurally related to azobenzene. It is used to color nonpolar substances such as oils, fats, waxes, greases, various hydrocarbon products, and acrylic emulsions.

They are used for staining of triglycerides in frozen sections, and some protein bound lipids and lipoproteins on paraffin sections. It has the appearance of reddish brown crystals.

**The Reaction:** Sudan III reacts with the lipids or triglycerides to stain red in colour. Lysochromes such as Sudan III bind to lipids but does not stick to any other substrate, hence will inform of the presence of lipids.

**Lab results:** The oil will stain red with Sudan III dye since it is a lipid and contains triglycerides. However, since the oil is less dense than water and insoluble in water, the oil will form a layer or globules above the water and appear as a red layer above the water in the test tube.



## **Application**

- Sudan stain test is often used to determine the level of fecal fat to diagnose steatorrhea. A small sample is dissolved in water or saline, glacial acetic acid is added to hydrolyze the insoluble salts of fatty acids, a few drops of alcoholic solution of Sudan III are added, the sample is spread on a microscopic slide, and heated twice to boil. Normally a stool sample should show only a few drops of red-orange stained fat under the microscope. The method is only semiquantitative but, due to its simplicity, it is used for screening.
- It is used for staining triglycerides in animal tissues (frozen sections), but it may also stain some protein bound lipids in paraffin sections.