



# Poster Instructions and grading


Fall, 2024


# Poster Size

The poster should contain concise and informative information about the thesis that was done by the student.

100 cm


70 cm

**Sudan Dyes I-IV in Food Samples**  
PHA501 Graduation Project  
Near East University



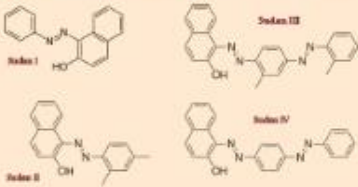
### Introduction

Sudan I-IV dyes belong to lipophilic azo dyes, they are illegally used as food additives, particularly in chili-containing foods (such as chili-, curry- and palm oil-containing foodstuffs, frozen meat products and spice mix), because of their intense red-orange color and low price. Although, Sudan I-IV dyes are not permitted worldwide, they had been found contaminating different food products and their presence is investigated regularly (since 2003) in food, cosmetics, waxes, solvents, textiles, and so on.



Sudan I and IV are mostly found in different types of chili and curry products (powders, sauces, etc.) as well as in seasonings and spice mixtures.

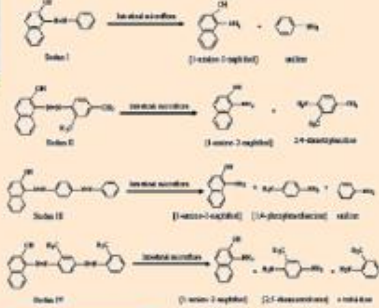
### Types of Sudan Dyes



Sudan I: O=C1C=CC(=C2C=CC(=C1N=N2)O  
Sudan II: O=C1C=CC(=C2C=CC(=C1N=N2)O  
Sudan III: O=C1C=CC(=C2C=CC(=C1N=N2)O  
Sudan IV: O=C1C=CC(=C2C=CC(=C1N=N2)O

### Metabolism of Sudan dyes

The metabolism of chemical compounds in different organs and, preferentially, in the liver of mammals, may also be responsible for bioactivation, instead of detoxification of parent compounds, according to the metabolites that are formed.



### Toxicity of Sudan Dyes

Sudan Dyes are classified as category 3 carcinogens by IARC and are therefore banned from the use in food in the EU. They generate metabolites that are converted to several active mutagens and carcinogens in humans, e.g. different amines (some of them classified as category 2 carcinogens). Sudan dyes are used in cosmetic products and animal testing has shown that isomers of Sudan III cause allergic reactions. Furthermore, the risk increases in the case of frequent consumption.

### Conclusion

Colorants have been used for decades to give colors to different materials for different purposes. Azo compound uses have been questioned in recent decades as the consequence of several findings on their chronic toxicity, mainly described in laboratory animals. In this review, we discuss several aspects of Sudan dyes, including their uses and food contamination, as well as the study of their toxicity, and metabolism.

### References

- Fonovich, T. M. (2013). Sudan dyes: are they dangerous for human health?. *Orig and chemical toxicology*, 36(3), 343-352.
- Li, T., Hao, M., Pan, J., Zeng, W., & Liu, R. (2017). Comparison of the toxicity of the dyes Sudan II and Sudan IV to catalase. *Journal of inorganic and molecular catalysis*, 371(10), 4219-43.

# Graduation Project Grading

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Poster evaluation	% 40
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Thesis evaluation	% 60
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# Evaluation of the poster

%10 Knowledge	%10 Answering Questions	%10 Poster Content	%10 Speech & Confidence	Total/40
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The background features a light grey base with several organic, overlapping shapes in muted colors: a large brown shape on the left, a green shape at the top right, and a light grey shape at the bottom right. A white, wavy line flows across the bottom right. In the top left, there is a faint, grey silhouette of a pine branch. The text "Thank you" is centered within the brown shape.

Thank you