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African Masks: Are They Authentic of Fake? A Fluorescence and Reflective UV-Vis Spectroscopic Approach
Kaitlyn Parrott, UNI Department of Chemistry and Biochemistry

Background
This project was a search for a new way to determine the authenticity of their African Mask collection.

The University of Northern Iowa Museum has allowed the non-destructive analysis of five of their African Masks and a collection of African wood samples.

This study is investigating if fluorescence spectroscopy and reflective UV-Vis spectroscopy of the African masks or the wood samples can be used to determine authenticity.

Of the five masks two are authentic masks, two are fake, and one the authenticity is unknown.

Instrumentation
- A handheld RadioSpectrometer was used for the collection of Data.
- The instrument set up and image are shown in Figure 2.
- Reflective UV-Vis Data Collection: the light source range was 400-1100nm.
- For the collection of fluorescence data the light sources are 255nm, 387nm, and 400nm.

Reflective UV-VIS-Near IR Data

- **Mask Bought in Free Town**
  - Little is known about this mask. We know that the mask was bought in Freetown and if from the Cultural Area of West Africa.
  - Reflective UV-VIS-Near IR of FT Mask: Mask vs. Select Wood Samples

- **Tome Landai Mask**
  - This mask originates from the Toma culture located along the borders of Guinea, Liberia, and Sierra Leone. The Landai Masks are an important role in the initiation of young men into the Toma Tribe.
  - Reflective UV-VIS-Near IR of Tome Landai Mask: Mask vs. Select Wood Samples

- **Kpeliye Mask**
  - This mask if from the Senufo Culture located along the Ivory Coast. The Kpeliye Masks are created and worn by initiates of the Poro secret men's society, and if signifies the initiation into the men’s secret community.
  - Reflective UV-VIS-Near IR of Kpeliye Mask: Mask vs. Select Wood Samples

- **Senufo Kpeliye Mask**
  - This mask is from the Senufo Culture located along the Ivory Coast. This style of mask combines human and animal features. The Kpeliye Mask represent the concept of feminine beauty and fertility, but were always owned and worn by men.
  - Reflective UV-VIS-Near IR of Senufo Kpeliye Mask: Mask vs. Select Wood Samples

Conclusions
- Based on the UV-VIS-Near IR Spectra, the wood the masks are made of could be the same wood as the samples that they are compared to in the UV-VIS-Near IR Data Section.
- Four of the five masks had some visible fluorescence with at least one of the wavelengths. Due to limitations in detection only the fluorescence of the Fang mask and the Kpeliye mask could be detected.
- Only one wood sample have fluorescence, which was the Opepe wood sample.
- There were limitations in the comparison of the wood and mask samples, due to limited number of unique features of the spectra.
- Currently, the authenticity of the Mask is inconclusive.

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References
2. University of Northern Iowa Museum Document. 2007.3.0008