

Chemistry Seminar: Using Nanoparticles Prepared From Organic Dyes to Prepare Faux Stained Glass Windows

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Abstract: In an effort to make fun nanoparticle projects for students in a summer science academy in nanotechnology, we followed the procedure from the University of Wisconsin <http://mrsec.wisc.edu/Edetc/nanolab/silver> for making gold and silver nanoparticles. These were immobilized in PVA to produce a dye solution which could be applied to glass or Plexiglas that looked like stained glass windows. Incorporation of nanoparticles in glass to make stained glass is a procedure that has been utilized since the Middle Ages.



The dye solutions produced by following this procedure were unpredictable, dull and unsuitable for use as stained glass. We then tried using organic dyes in place of the metallic dyes, and found that they gave the intense color that we had been seeking. Many of the dyes used are food dyes and may actually be safer than metallic dyes. Although the art form product resulting from this research were not colored in the same manner as traditional stained glass windows, the colors produced by nanoparticles were very vivid and allowed the light to pass through because of their very small size. These nanodyes and their applications will be discussed.

Dr. Ann Nalley is a Professor of Chemistry in the Physical Science Department at Cameron University, a position that she has held since 1969. Her research includes new product development and solving industrial problems in the area of cosmetic analysis, nanostructural materials, applied research in the petroleum industry and computer molecular modeling.

She served as the President of the American Chemical Society (the largest scientific society in the world) in 2006. She has a long record of service to the American Chemical Society at the local, state, regional and national level. She is a member of the PACIFICHEM Organizing Committee and was the first woman to be appointed to that position. She also serves as the deputy chair of the Mata Conferences which bring scientists together in the Middle East for establish research collaborations to solve environmental and energy related problems which affect countries in the Middle East and to work toward solving political problems in this area. She has served as a Councilor for more than 25 years. In 1996, she was awarded the Division of Professional Relations' Henry Hill Award for Outstanding Contributions to Professionalism and was named the Oklahoma Chemist in 1992. She was the first and only woman to receive this award. In 2005, she received the Professional Excellence Award from the National Iota Sigma Pi Honor Society for Women in Chemistry. In 2008, she was recognized as one of the top 50 women in the state of Oklahoma by the Journal Record. In August, 2009, she was inducted as one of the first group of American Chemical Society Fellows.