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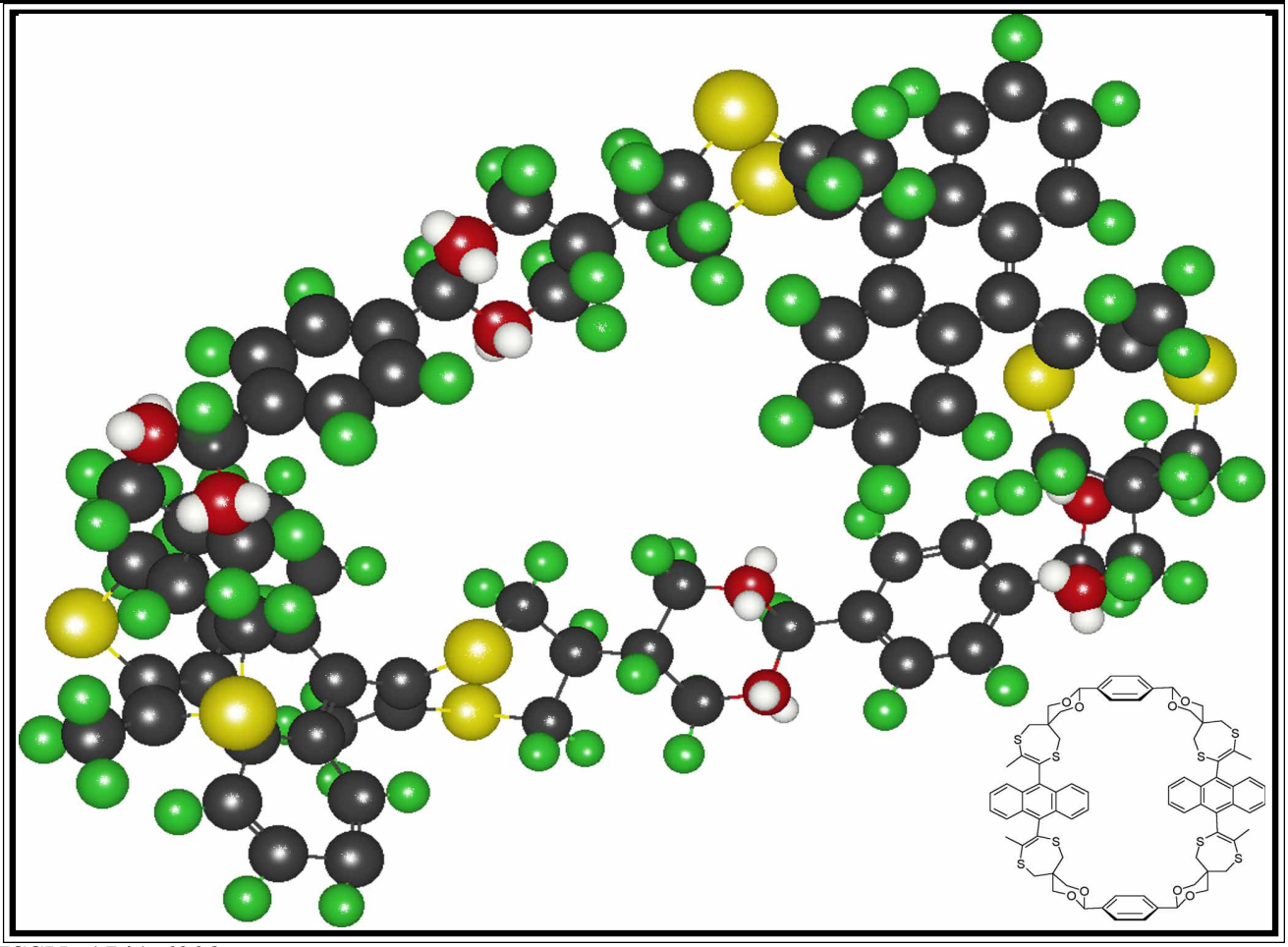

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SPECTROPHOTOMETRIC CHARACTERIZATION OF ALUMINUM-ANTHOCYANIN COMPLEXES IN A MODEL SYSTEM FOR FLORAL COLORATION

The model system of aluminum complexing with anthocyanidins in acidic ethanol was developed to understand metal-induced coloration in flowers. Delphinidin required less of an excess of aluminum to form a stable complex with Al^{3+} than did petunidin, which in turn required less than cyanidin, all in this model system. The catechol unit on the B ring of the core anthocyanidin was the functional site for such complexation. In acidic ethanol, all anthocyanidins in the absence of Al^{3+} exist as red flavylium cations. Al^{3+} removed two protons from delphinidin, petunidin, or cyanidin forming a blue quinoidal base anion, which in turn complexed with Al^{3+} in this model system. Furthermore, another anthocyanidin as a flavylium cation stacked on top of this resulting complex. Sugar substitution on the basic anthocyanidin tended to destabilize somewhat the formation of a stacked complex with aluminum. Spectrophotometric characterization showed the new absorbance attributed to the quinoidal base anion or complexed anthocyanidin, as well as the stacked flavylium cation, having the same shape and absorptivity but showing a bathochromic shift from the free flavylium cation, together resulted in a bluing of the model system and of certain flowers.

Henry D. Schreiber†, Andrew H. Jones*, Amy M. Swink*, Corinne M. Lariviere*, and Taylor D. Godsey*, Department of Chemistry, Virginia Military Institute, Lexington, VA 24450, HS@vmi.edu

PYRIMIDINE DEGRADATION IN PSEUDOMONAS MENDOCINA ATCC 25411

The effects of carbon and nitrogen sources on the enzymes of the pyrimidine degradative pathway were investigated in cells of Pseudomonas mendocina. Microorganisms utilize the pyrimidine reductive pathway to degrade nitrogenous bases for their nitrogen. It has previously been determined that pseudomonads degrade pyrimidines through this reductive pathway; therefore, this catabolic pathway was studied in P. mendocina. There are three reductive pathway enzymes that were assayed to determine their specific activities when grown in various nutrient sources. Results from this study indicate that when cells of P. mendocina were grown in liquid medium containing glucose and ammonium sulfate, dihydropyrimidine dehydrogenase activity was repressed compared to other nitrogen sources. Of interest, the highest enzyme activities in the reductive pathway were seen with dihydropyimidinase. Ultimately, this study showed that the catalytic activities of the degradative pathway enzymes were regulated relative to the carbon sources and the selected nitrogen sources used in this investigation.

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DEVELOPMENT OF A DITHIEPIN FRAMEWORK FOR NOVEL HOST MOLECULES

Dithiepins are electron rich organo-sulfur aromatic frameworks that are UV active. Incorporating these dithiepin frameworks into host-type molecules allows UV activity to be used as a means of monitoring association/complex formation between our dithiepin based host and an electron deficient aromatic guest. The present work develops a model scheme that could be used to incorporate one or more dithiepin frameworks into host molecules. The model scheme provides the flexibility of two approaches toward synthesizing a dithiepin based host.

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ENHANCEMENT EFFECTS OF SURFACTANTS ON THE DC PLASMA ANALYSIS OF P-BLOCK ELEMENTS, PART I: GALLIUM AND INDIUM

Investigation of the enhancement effects of several surfactants on the emission lines of gallium and indium using a three electrode Direct Current Plasma, DCP, is reported. Of the seven different micellar systems (ADS, ammonium dodecyl sulfate; LDS, lithium dodecyl sulfate; SDS, sodium dodecyl sulfate; KDS, potassium dodecyl sulfate; CPB, cetylpyridinium bromide; CTAB, cetyltrimethyl ammonium bromide; Triton X-100) studied the greatest and most consistent enhancement occurred in the presence of SDS. Because of this sodium sulfate was also studied where enhancement was also observed. This effect can be explained by a combination of earlier observed phenomena: effects of easily ionized elements, increased Penning ionization, thermal pinch and increased residence time in the plasma.

Aaron Hickman* and Daniel Y. Pharr†, Chemistry Department VMI, Lexington, VA 24450, pharrdy@vmi.edu

REDUCING UNSATURATED ORGANIC COMPOUNDS VIA TRANSFER HYDROGENATION USING WILKINSON'S CATALYST AND ISOPROPANOL

The reduction of unsaturated organic substrates, such as alkenes or carbonyl containing compounds, is conventionally performed using hydrogen gas and a transition metal catalyst. In catalytic transfer hydrogenation, hydrogen is added to an unsaturated organic compound without using gaseous H_2. In the reactions described in this paper, isopropanol was employed as the hydrogen transfer agent, which, upon removal of hydrogen, was converted to acetone. Wilkinson's catalyst $[RhCl(PPh_3)_3]$ was used as the hydrogen transfer catalyst to successfully reduce organic compounds containing C=C and C=O bonds. Using this method, the ketones acetophenone and benzophenone were successfully reduced to the secondary alcohols 1-phenylethanol and diphenylmethanol respectively. In addition, an alkene (1-hexane) was saturated to an alkane (hexane) and 5-hexen-2-one, a compound containing both C=C and C=O bonds, was converted to 2-hexanol. The formation of acetone, produced when hydrogen was removed from the isopropanol hydrogen transfer agent, was monitored using infrared spectroscopy and the products confirmed via gas chromatography where relevant.

Danielle Mazza*, Tiffany Simons*, Adam Toth* and Stephen Anderson†, School of Theoretical and Applied Science, Ramapo College of New Jersey, Mahwah, NJ 07430, standers@ramapo.edu

ASSIGNMENT OF ^{1}H AND ^{13}C RESONANCES IN A-CIS $[CO(AMPY)_2(NO_2)_2]NO_3$

The compound a-cis $[Co(ampy)_2(NO_2)_2]NO_3$ was studied by a series of one and two-dimensional NMR experiments, including DEPT, COSY, homonuclear J-resolved, and HETCOR. Through the use of two-dimensional techniques, it was possible to do a complete assignment of the ^{1}H and ^{13}C resonances in this compound.

Mark McClure† and Sandra Buffkin*, Department of Chemistry and Physics, The University of North Carolina at Pembroke, Pembroke, NC

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