Abstract

Thiosemicarbazones are a class of organic compounds that function extremely well as ligands that bind to transition metals to form metal complexes with interesting biological properties. This presentation focuses on synthesis and characterization of a new series of monoxime thiosemicarbazone. Two new compounds, namely α-isonitrosacetophenone ethyl thiosemicarbazone (INAP-ETSC) and α-isonitrosacetophenone tert-butyl thiosemicarbazone (INAP-tButyl), are synthesized and characterized by Nuclear Magnetic Resonance Spectroscopy (NMR). The synthesized compounds are further used to create the palladium-ligand complexes that can be tested for their anticancer properties by studying the inhibition of topoisomerase 2α.

Synthesis of INAP Ligands

In a 50 mL Erlenmeyer Flask equipped with a magnetic stir bar, 1.15-13 mol of INAP and 1.15-13 mol of RTSC (RTSC = ETSC or tBuTSC), were added to 50 mL of 1% acetic acid. The obtained mixture was stirred at 60 °C on for 24 – 72 hours when a suspension was obtained. The solids were then filtered using gravity filtration and characterized using Infrared and Nuclear Magnetic Resonance Spectroscopy.

Infrared Spectra for INAP Ligands

<table>
<thead>
<tr>
<th>Compound</th>
<th>C=O</th>
<th>New C=N</th>
<th>Old C=N</th>
</tr>
</thead>
<tbody>
<tr>
<td>INAP</td>
<td>1672</td>
<td>N/A</td>
<td>1595</td>
</tr>
<tr>
<td>INAP-ETSC</td>
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<td>1583</td>
<td>1478</td>
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<tr>
<td>INAP-tTSC</td>
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<td>1470</td>
</tr>
</tbody>
</table>

Possible Conformations for INAP-tTSC Ligand

- s-cis
- H-bonded
- s-trans

References


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