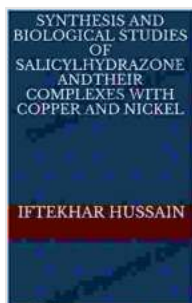


# Synthesis And Biological Studies Of Salicylhydrazone Andtheir Complexes With

Salicylhydrazones, a class of organic compounds derived from salicylaldehyde and hydrazine, have captivated the attention of researchers in diverse fields due to their remarkable properties and wide-ranging applications. This article delves into the fascinating world of salicylhydrazones, exploring their synthesis, biological significance, and complexation chemistry.



## SYNTHESIS AND BIOLOGICAL STUDIES OF SALICYLHYDRAZONE AND THEIR COMPLEXES WITH COPPER AND NICKEL

★★★★☆ 4 out of 5

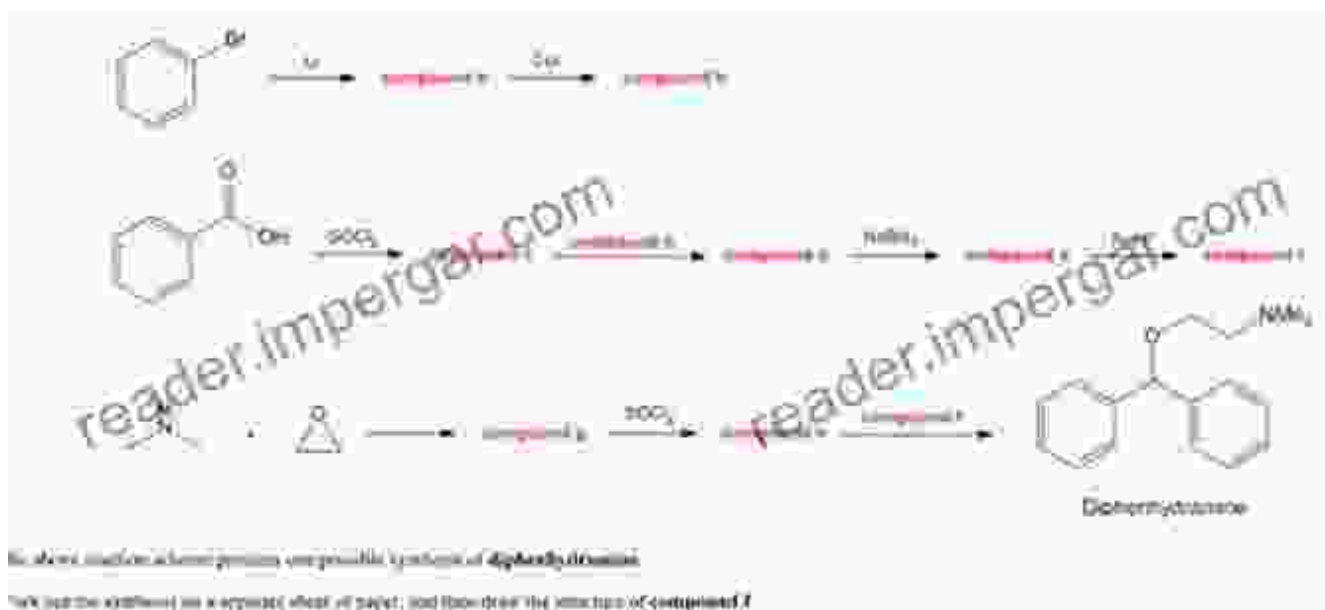
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### Synthesis of Salicylhydrazones

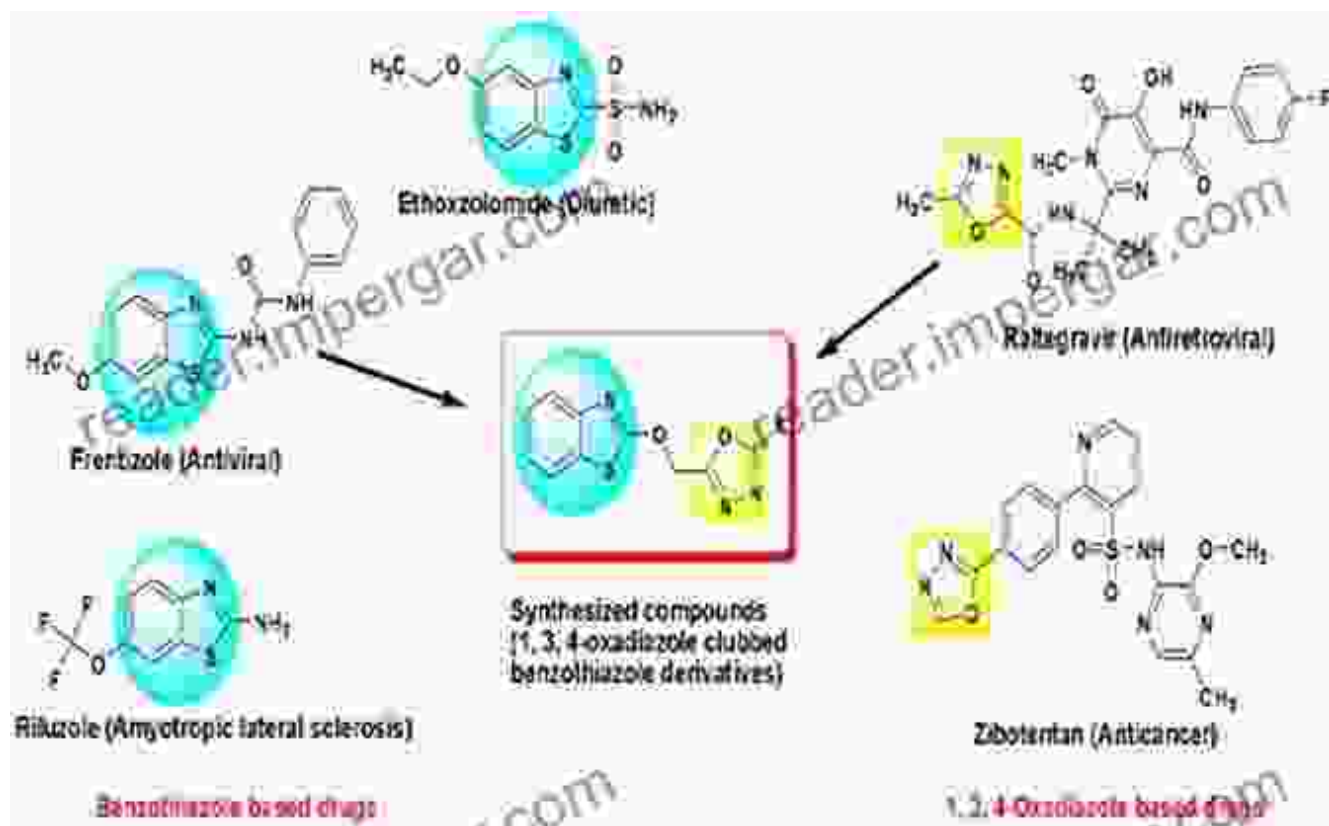
The synthesis of salicylhydrazones is a straightforward and versatile process. It typically involves the condensation reaction between salicylaldehyde and a suitable hydrazine derivative in the presence of an acid catalyst. This reaction yields the corresponding salicylhydrazone,

which can be further functionalized or modified to obtain various derivatives with tailored properties.



## Biological Studies of Salicylhydrazones

Salicylhydrazones have demonstrated a diverse range of biological activities, including antibacterial, antifungal, and anticancer properties. Their antimicrobial activity is attributed to their ability to chelate metal ions essential for microbial growth and metabolism. Salicylhydrazones have also shown promising anticancer activity, with some derivatives exhibiting selective cytotoxicity against cancer cells.



## Complexation Chemistry of Salicylhydrazones

Salicylhydrazones possess excellent chelating properties, forming stable complexes with various transition metal ions. These complexes have attracted considerable interest due to their potential applications in catalysis, sensing, and medicinal chemistry. The coordination chemistry of salicylhydrazones is influenced by the number and arrangement of donor atoms, as well as the steric and electronic effects of the substituents on the hydrazone moiety.

Magnetic moment,  $\mu = \sqrt{n(n+2)}$  (spin only)

$= \sqrt{3(3+2)}$

$= \sqrt{15}$

(i) IUPAC name = Pentaamminechloridocobalt(III) chloride

Coordination number = 6

Oxidation state of Co:

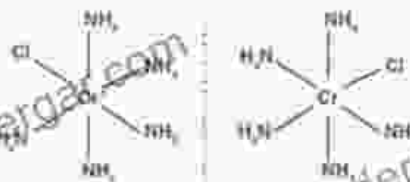
$x + 0 = 1 \Rightarrow x = 2$

$x = 3$

Electronic configuration:  $3d^5 = 5e^-$

Shape: Octahedral

Stereochemistry:



$n = 0$

Thus, Magnetic moment = 0

(ii) IUPAC name = Tris(oxalato)cobalt(III)

Coordination number = 6

Oxidation state of Co:

$x - 3 \times 0 = 0$

$x = 3$

Electronic configuration:  $3d^5 = 5e^-$

Shape: Octahedral

Stereochemistry:

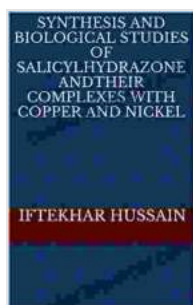
## Applications of Salicylhydrazones

The unique properties of salicylhydrazones make them promising candidates for a wide range of applications, including:

- **Medicine:** As antimicrobial and anticancer agents

- **Materials science:** As ligands in coordination polymers and metal-organic frameworks
- **Catalysis:** As catalysts for various chemical reactions
- **Sensing:** As selective chemosensors for metal ions

Salicylhydrazones are a versatile class of compounds with a captivating blend of properties. Their synthesis, biological significance, and complexation chemistry have opened up exciting avenues for research and innovation. As the understanding of these compounds continues to deepen, we can anticipate the development of novel applications in medicine, materials science, and beyond.



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