MICROWAVE SYNTHESIS OF SOME NEW ORGANO SELENIUM COMPLEX COMPOUNDS AS (LIGANDS), DERIVATIVES FROM SCHIFF BASES AND PROVE THEIR STRUCTURES BY USING FTIR SPECTRUM

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ABSTRACT
The microwave technique is a new method for synthesis of organic compounds which results in pure and high percent of products and completed reactions with short time, compared with conventional method (heating method). The prepared Schiff bases allowed to react with (Selenium Metal, Se₃₄, 1st serial of transition elements), to yield Selenium complex compounds as (Ligands). The useful thing in microwave technique is using without solvent there for it called (dry method). The synthesized compounds were identified using melting point apparatus, (FT.I.R) Infrared spectroscopy.

Keywords: Organo, Selenium, Schiff Bases, Microwave

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INTRODUCTION
Microwave technique method is appears lastly which employed widely as a new method instead of the (refluxing method) in organic synthesis, because this method is effective and economic, there for it called (MAOS) method, by this method we have high percent and high purity of product compounds with chosen reactions, the reaction completed with very short time compared with conventional methods. Microwave method acts by mechanical (Ionic motion) which that generated by the passed electrical field in chemical reaction. When we increase the power of microwave radiation the heat of the parameter of reaction increase too, there for the conductance energies more effective especially when the reaction is Ionic material this cause absorption of the microwave rapidly, and cause chemical reactions soon(¹). There are different ways for prepare (Selenium complex compounds as (ligands) for example direct addition of selenium metal to the Schiff base (−C≡N−H)(²). Microwave is an electromagnetic radiation with a frequency about (0.3 to 300 GHz)(³⁴). The oregano selenium complex compounds occurs in different chemical forms, which determine its bioavailability function and toxicity to human health, while inorganic selenium can be found in different minerals in there of selenites and selenates, main organic forms are selenoaminoacids, selenopeptides and selenoproteins as complex compounds (ligands). Thus the physiology or the biochemistry of organic
selenium is mediated basically by into incorporation into selenoproteins. Oregano selenium compounds can be defined as chemical compounds that contain both Selenium and carbon. Other elements, such as halogens, oxygen and sulfur, or nitrogen are also frequently present in their structures. Achelate is a chemical compound composed of a metal ion and anachelating agent. A chelating agent is a substance whose molecule conforms several bonds to a single metal ion. In other words, a chelating agent is a multidentate ligand. All the resultant compounds are identified and examined by melting point apparatus and FTIR spectroscopy.

MATERIALS AND METHODS

Synthesized compounds:

1. **1,2-bis(1H-1,3-benzo[e][1,2,3]hydroxyselenazin-3-yl)ethane**

2. **1,2-bis(1H-1,3-benzo[e][1,2,3]hydroxyselenazin-3-yl)cyclohexane**

3. **5-(2F5,4F3-butyl-2-yl)-5′-butyl-1F3,1′F3,3,3′-tetrathia-2F3,2′F3,6,6′-tetrasinglene-5F4,5′F4-diaza-2,2′-bi(bicyclo[2.2.0]hexane-4,4′-diene)**

4. **4-(3-(4-bromobenzylidene)-3,4-dihydro-4-oxaselenadiazol-5-yl)phenol**

5. **...**
All materials were from Aldrich and were used further purification.

**Instruments**

a- microwellengrate 8020 (privilege).
b- FTIR Spectrophotometer Model Shimadzu 8400.
c- Melting point apparatus Model Gallen Kamp (11Hz).

**Synthesis of the selenium complex compounds (ligands)**

Take (0.02 mol.) from prepared suitable Schiff base, mixed and crashed with (0.02 mol.) of selenium metal, and Irradiated by microwave technique for (2-5 minutes) yield the compounds (1 – 8) respectively, the products cool and recrystallized by ethanol (Table 1).
### Table 1: Physical properties of the prepared compounds

<table>
<thead>
<tr>
<th>Comp No.</th>
<th>Schiff bases parent starting material M.P.C.</th>
<th>Colour powder</th>
<th>Molecular Formula</th>
<th>Yield %</th>
<th>m.pºC</th>
<th>M.WI (Watt)</th>
<th>React time mined</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>86 – 88</td>
<td>Black</td>
<td>C_{16}H_{16}N_{2}O_{2}Se_{2}</td>
<td>85</td>
<td>135-137</td>
<td>80</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>118 – 120</td>
<td>Black</td>
<td>C_{20}H_{22}N_{2}O_{2}Se_{2}</td>
<td>80</td>
<td>120-122</td>
<td>380</td>
<td>5</td>
</tr>
<tr>
<td>3.</td>
<td>88 – 90</td>
<td>Brown</td>
<td>C_{10}H_{18}N_{2}S_{4}Se_{4}</td>
<td>76</td>
<td>115-117</td>
<td>60</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>220 – 222</td>
<td>Black</td>
<td>C_{14}H_{11}N_{2}O_{4}BrSe</td>
<td>92</td>
<td>240-242</td>
<td>350</td>
<td>5</td>
</tr>
<tr>
<td>5.</td>
<td>181 – 183</td>
<td>Brown</td>
<td>C_{13}H_{11}N_{2}OSe</td>
<td>98</td>
<td>265-267</td>
<td>360</td>
<td>6</td>
</tr>
<tr>
<td>6.</td>
<td>259 – 261</td>
<td>Black</td>
<td>C_{14}H_{11}N_{2}O_{3}Se</td>
<td>97</td>
<td>283-285</td>
<td>370</td>
<td>5</td>
</tr>
<tr>
<td>7.</td>
<td>151 – 153</td>
<td>Black</td>
<td>C_{14}H_{11}N_{2}OCLSe</td>
<td>75</td>
<td>187-189</td>
<td>350</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>238 – 240</td>
<td>Brown</td>
<td>C_{16}H_{17}N_{3}OSe</td>
<td>88</td>
<td>276-278</td>
<td>340</td>
<td>4</td>
</tr>
</tbody>
</table>

The reactions Schema

![Reactions Scheme](image_url)

**RESULTS AND DISCUSSION**

The synthesis of selenium complex compounds by (Microwave technique) which started from the aromatic Schiff bases to produce the (1– 8) selenium complex compounds as ligands which determined and proved...
and identified by FTIR spectral data showed the bands of the functional groups that substituted in rings or in others. Because the more resembles between the compounds. We take the FTIR of (1,3,6) compounds respectively as samples (Figure 1, 2, 3). The bands at (1610 cm⁻¹) due to the (–C≡N–) groups in all prepared compounds. The observed bands at (3650, 3452) cm⁻¹ are due to the (–OH) groups in the compounds (1, 6) respectively. The aromatic rings bands (C=C) are observed at (1600, 1608, 1683) cm⁻¹ due to the (C=C) groups. The bands in the region (2928, 2980, 2870, 2928) cm⁻¹ all this bands due to the aliphatic (–CH₂) in compounds (1, 3). The diaple (–CH₃) substituted groups in compound (8) observed at (707 cm⁻¹).

Fig. 1: FT.I.R. Spectrum for compound No. (1)

Fig. 2: FTIR Spectrum for compound No. (3)

Fig. 3: FTIR Spectrum for compound No. (6)
CONCLUSION

The useful thing in microwave technique is using without solvent there for it called (dry method).

RECOMMENDATION

a) Must be evaluation of the biological activity for the prepared organo selenium complex compounds and other transition elements on the fungal and bacterial.
b) Prepare other organo selenium complex compounds because its scientific importance for the produce insecticide and other new industrial products
c) Studying the toxicity of the prepared organo selenium complex compounds (Ligands) and trying it on the rats and monkeys
d) Studying the possibility of using (Schiff Bases) derivatives and (organo selenium) complex compounds as selected reagents for other salts (ions) in the drugs and insecticide.

ETHICAL CLEARANCE

The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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REFERENCES


