Of the many potential applications of sydnones, the one which has attracted the utmost attention is their biological activity. A considerable number of sydnones have been prepared and studied for their pharmacological activity. Sydnones belong to an interesting class of compounds known as mesoionic compounds.

Mesoionic compounds containing five membered heterocyclic rings, may be divided into two types; in the first, the two hetero atoms X and Y, each of which contributes two electrons, are nonadjacent I, and in the second they are adjacent II.
In I, V and W may be chosen from R-C, and -N,
X and Y may be chosen from R-N, -O, and -S,
Z may be chosen from O, S, R-N, and R-C-R.

In II, V and W may be chosen from R-C and -N,
X and Y may be chosen from R-N, -O, and -S,
Z may be chosen from O, S, R-N, and R-C-R.

Of the 144 possible systems in the type I, the
more familiar ones are the sydnones III, but many others
are known, and research in this field is being actively
persued, since the realisation that such compounds undergo
a variety of reactions and they also possess biological
activities.

III
Out of various combinations theoretically possible, many compounds belonging to type I are being synthesised.

Not many compounds belonging to type II are known, although dehydrodithizone IV, was the first mesoionic compound to be discovered (1).

But later Bamberger et al. (2,3) reported the related tetrazolium oxide V and tetrazolim benzoylimine VI.

Recently some more members of this type reported, are derived from pyrazole VII, isothiazole VIII and
So far, no compound belonging to type II, has undergone electrophilic substitution reactions, whereas some of the members of the type I undergo various types of electrophilic substitution reactions. Sydnones, the most studied of them all, undergo all reactions which are typical of aromatic compounds.

It is interesting to note here that, the compounds belonging to type I, differ markedly in their physical and chemical behaviour from type II. There is no generality of the physical and chemical properties even amongst the compounds of the same type, viz., when i.r. and n.m.r. of sydnones are compared with other mesoionic compound like oxatriazole one finds lot of difference.

The i.r. and n.m.r. values of selected mesoionic
systems are tabulated here to emphasise the contrasting spectral properties,

<table>
<thead>
<tr>
<th>Structure</th>
<th>u.v.</th>
<th>i.r.</th>
<th>n.m.r.</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\mu$</td>
<td>$\text{cm}^{-1}$</td>
<td>$J$</td>
<td></td>
</tr>
<tr>
<td>Sydnonimine</td>
<td>288-324</td>
<td>1588-1606</td>
<td>1.9</td>
<td>5,6,7.</td>
</tr>
<tr>
<td>Sydnone</td>
<td>310</td>
<td>1730-1830</td>
<td>3.2</td>
<td>8.</td>
</tr>
<tr>
<td>Oxo-oxazole</td>
<td>310</td>
<td>1780-1880</td>
<td>-</td>
<td>9,10.</td>
</tr>
<tr>
<td>Oxo-triazole</td>
<td>270</td>
<td>1660-1680</td>
<td>0.0</td>
<td>11,12.</td>
</tr>
<tr>
<td>Structure</td>
<td>u.v.</td>
<td>i.r.</td>
<td>n.m.r.</td>
<td>Ref.</td>
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<tr>
<td><strong>Ph</strong>—<strong>N</strong>—<strong>C</strong>—<strong>H</strong></td>
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<tr>
<td>Iso-sydnone</td>
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<tr>
<td><strong>Ph</strong>—<strong>N</strong>—<strong>C</strong>—<strong>H</strong></td>
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<tr>
<td>Thiadiazolethione</td>
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<tr>
<td><strong>R</strong>—<strong>N</strong>—<strong>N</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>H</strong>—<strong>C</strong>—<strong>N</strong>—<strong>C</strong>—<strong>S</strong></td>
<td>240-300</td>
<td>1350</td>
<td>0.1</td>
<td>15,12,11.</td>
</tr>
</tbody>
</table>

No unanimous conclusion can be drawn from the above data, regarding the formulation of these compounds as aromatic.
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