NEW TRENDS AND STRATEGIES IN THE CHEMISTRY OF ADVANCED MATERIALS WITH RELEVANCE IN BIOLOGICAL SYSTEMS, TECHNIQUE AND ENVIRONMENTAL PROTECTION

# NOVEL *vic*-DIOXIME LIGANDS AND ITS ANTIMICROBIAL ACTIVITY

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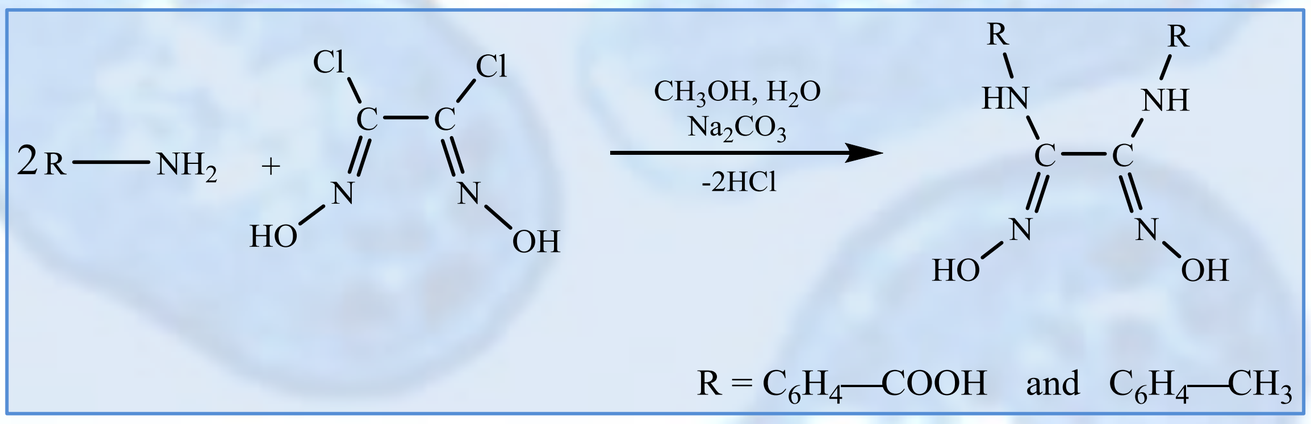
The vic-dioximes are compounds with various industrial uses and scientific applications [1–3]. Many coordination compounds have been synthesized based on vic-dioximes. After condensation with dichloroglyoxime of p-aminobenzoic acid and p-aminotoluene two new vic-dioxime ligands were obtained. Their structures were proved by IR, $^{1}H$, $^{13}C$ and $^{15}N$ NMR spectral analysis and single crystal X-ray diffraction. After diffraction, the new *vic*-dioxime bis(*p*-aminobenzoic acid) glyoxime hydrate ($H_4L^1 \cdot H_2O$, **1**) and bis(di-*p*-aminotoluene glyoxime) mono-*p*-aminotoluene trihydrate ($(H_2L^2)_2 \cdot pat \cdot 3H_2O$, **2**), were obtained. The reaction proceeded according to the scheme:




Antimicrobial activity was tested for both ligands. One of the reported vic-dioximes, bis(di-p-aminotoluene)glyoxime mono-p-aminotoluene trihydrate showed good to moderate antimicrobial activity against both non-pathogenic Gram-positive and Gram-negative bacteria (*Bacillus subtilis* and *Pseudomonas fluorescens*), phytopathogenic (*Xanthomonas campestris*, *Erwinia amylovora*, *E. carotovora*) and the fungi (*Candida utilis* and *Saccharomyces cerevisiae*) at MIC – 70-150 μg/mL (Table).

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| MBC and MFC, μg/mL | | | | | | | |
|---|---|---|---|---|---|---|---|
| Compound | *Bacillus subtilis* | *Pseudomonas fluorescens* | *Erwinia amylovora* | *Erwinia carotovora* | *Xanthomonas campestris* | *Candida Utilis* | *Saccharomuces cerevisiae* |
| **1** | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **2** | 70 | 150 | 70 | 150 | 150 | 70 | 150 |

*MBC – minimal bactericidal concentration;*
*MFC - minimal fungicidal concentration;*
*N/A – non active*

**Table.** In vitro antifungal and antibacterial activities of compound **1** and **2**.

Looking to the data presented in Table it is well seen that compound **2** exhibits variable biological activity depending on the bacterial or fungicidal species. A possible cause of this variation could be the impermeability of the cells of the microorganism or the difference between the ribosomes of the microbial cells [4].

**Bibliography**

1. Kanno H., Yamamoto H. Patent, EP 0.636.605A1 (1994).
2. Serin S. Trans. Met. Chem. 26(2001) 300-306.
3. Boyer J.H. Chem. Rev. 80(1980) 495-561.
4. Kurtoğlu M., Dagdelen M.M., Toroğlu S. Trans. Met. Chem. 31(2006) 382-388.

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