

## Poster Session

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### Complexes of Mn(II) with imidazole and 2-thiophene acetic acid ligands

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The reactions of 2-thiophene acetic acid and imidazole with manganese (II) chloride resulted in mononuclear [Mn(C<sub>6</sub>H<sub>5</sub>O<sub>2</sub>S)<sub>2</sub>(C<sub>3</sub>H<sub>4</sub>N<sub>2</sub>)<sub>6</sub>] (1), or binuclear [Mn<sub>2</sub>(C<sub>6</sub>H<sub>5</sub>O<sub>2</sub>S)<sub>4</sub>(C<sub>3</sub>H<sub>4</sub>N<sub>2</sub>)<sub>4</sub>] (2) and [Mn<sub>2</sub>(C<sub>6</sub>H<sub>5</sub>O<sub>2</sub>S)<sub>4</sub>(C<sub>3</sub>H<sub>4</sub>N<sub>2</sub>)<sub>4</sub>(H<sub>2</sub>O)] (3) complexes.

In the complex (1), the Mn ion is octahedral coordinated by six nitrogen atoms from six imidazole rings and the Mn-O bond lengths are in the range 2.261(4) to 2.275(6) Å. The crystal packing is stabilized by weak C-H...O and N-H...O hydrogen bonds.

In the structure of (2), the asymmetric unit is formed from an Mn ion bonded to two N atoms from two imidazole ligands and to three O atoms from three different thiophene acetic acid ligands. Two of these ligands are deprotonated and bridge by the same oxygen atoms between the second manganese ion giving rise to a binuclear complex. In this complex, each Mn cation is located in a slightly distorted square-planar environment and the Mn-N bond lengths are in the range 1.960(3) to 1.976(2) Å. The Mn-O bonds lengths in the square base of the two pyramids are in the range 1.956(5) to 2.000(1) Å. The Mn-O axial bond distance is quite longer than the Mn-O equatorial bond distances and is 2.458(2) Å [1,2]. The crystal packing is stabilized by weak C-H...O and N-H...O hydrogen bonds forming connected layers parallel to (001) planes.

When an oxygen of one molecule of water bridges the two metal centers in the complex (2), the environment of the two Mn becomes octahedral and thus we obtain the complex (3). In this latter complex, the Mn-N bonds are in the range 2.192(4) to 2.245(4). All Mn-O bonds are between 2.148(6) and 2.232(7) Å.

All structures are disordered in all thiophenyl rings occupy alternatively two positions related to one another by an 180° rotation about the C-C sigma bond [3]. The sulfur and one carbon atom of the ring occupy the same position.

The complexes were structurally characterized by single crystal X-ray diffraction analyses, infrared spectroscopy (IR), elemental analyses and thermogravimetric analyses (TGA).

Cristal data:

(1): MnC<sub>30</sub>H<sub>34</sub>N<sub>12</sub>O<sub>4</sub>S<sub>2</sub> in C2/c, a=11.3492(6), b=13.9186(7), c=22.2101(13), beta= 94.963(4)

(2): Mn<sub>2</sub>C<sub>36</sub>H<sub>36</sub>N<sub>8</sub>O<sub>8</sub>S<sub>4</sub> in P21/n, a=15.996(2), b=10.274(13), c=26.141(3), beta=97.715(9)

(3): Mn<sub>2</sub>C<sub>24</sub>H<sub>38</sub>N<sub>8</sub>O<sub>9</sub>S<sub>4</sub> in P21/n, a=26.206(2), b=8.5421(8), c=19.0694(17), beta= 92.229(4)

[1] A. Patra et al., *Journal of Molecular Structure* 1047 (2013) 317–323, [2] S. Abbas et al., *Journal of Organometallic Chemistry* 724 (2013) 255-261,

[3] F. Cagnin et al., *Polyhedron* 67 (2014) 65–72

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