Poster Presentation

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Salts and Co-Crystals of Agomelatine

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Salts and co-crystal are multicomponent solids but in different ionization states. In salts, there is a proton transfer between the molecular components, making it contain cations and anions. On the other hand, co-crystals are made up from neutral molecules held together by non-bonded interactions. Agomelatine is an active pharmaceutical ingredient (API) used as an antidepressant. Because the search for new solid forms of an API is an important step in a drug development, our aim was to prepare novel co-crystals of agomelatine. Phase analysis was done by powder X-ray diffraction and the structures were solved from single-crystal X-ray diffraction data. Further analyses were done by infrared and Raman spectroscopy and solid state NMR. For agomelatine, several co-crystals have been prepared, namely with citric acid, maleic acid, oxalic acid, 4-hydroxybenzoic acid and isonicotinamide. Agomelatine is an amidic compound and, since amides are considered very neutral, it was quite a surprise, when agomelatine in the combination with benzensulphonic, hydrobromic and hydroiodic acids produced salts. Structural comparison of all the solid phases in the respect of ΔpKA, amidic group bond lengths, conformation and packing of agomelatine and position of the guest molecule in the crystal lattice is also given. For pharmaceuticals, the determination whether the material is a salt or a co-crystal is interesting not only academically, but also from the regulatory point of view. Therefore, our findings may play a crucial role in the future development of the multicomponent solid phases of agomelatine. This work was supported by the Grant Agency of Czech Republic, Grant No. 106/14/03636S and the specific university research, Grant No. A2-FCHT-2014-081.

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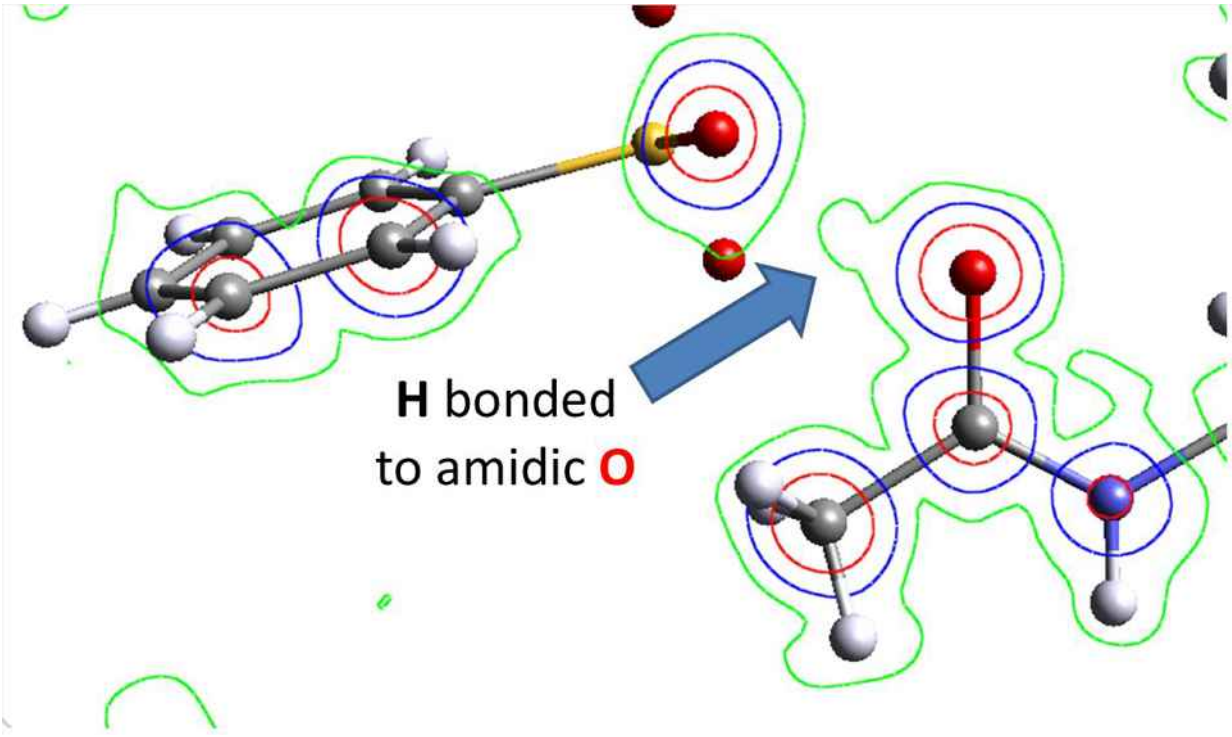

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