

X-RAY POWDER DIFFRACTION AND SORPTION-DESORPTION INVESTIGATIONS OF INDAPAMIDE

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Many pharmaceutical solids are known to form one or more hydrated forms. When the water molecules in these bimolecular crystals are an integral part of the crystal structure (the case of true hydrates) a distinct change or collapse of the crystal structure appear when the water molecules are removed from the solid. In the case of the non-stoichiometric hydrates there is no simple ratio of water to host molecules. These not well defined hydrates can take up or lose water as the humidity is varied. Some hydrates can lose water without a significant change of the crystal structure. This is due to the formation of a stable crystal packing of the host molecules. In the case of other non-stoichiometric hydrates some structural changes are observed due to the changes in water content. In order to find out the kind and extend of changes of the crystal lattice dependent on the water content it is important to use suitable analytical methods like moisture sorption studies combined with x-ray powder diffractometry [1, 2].

In the present study the crystal lattice of indapamide is investigated at various degrees of humidity in the atmosphere. Sorption – desorption studies showed that indapamide takes up about 1-1,8 weight percent of water at ambient conditions. The unit cell parameters ($a=23.83 \text{ \AA}$, $b=9.70 \text{ \AA}$, $c=15.1 \text{ \AA}$, $\beta=91.62^\circ$) and a probable space group (P21/c) were determined from the x-ray powder diffraction pattern obtained at ambient conditions using CRYSFIRE [3] and CHECKCELL [4] software. X-ray powder diffraction patterns obtained in situ in humidity chamber at different humidity levels proved minor changes in the unit cell parameters.

References:

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- 2 S. R. Byrn, R. R. Pfeiffer, J. G. Stowell. Solid – State Chemistry of Drugs, (1999), chapter1, SSCI Incorporation.
- 3 <http://www.ccp14.ac.uk/tutorial/crys/index.html>
- 4 <http://www.ccp14.ac.uk/ccp/web-mirrors/lmgp-laugier-bochu/>