

MS25-P3 Pyrazinamide cocrystals with dicarboxylic acids by liquid assisted grinding Duane Choquesillo-Lazarte,^a Cristóbal Verdugo-Escamilla,^a Juan Manuel García Ruiz^a ^aLaboratorio de Estudios Cristalográficos, IACT, CSIC, SPAIN
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Cocrystals have received much attention in recent years, especially in the pharmaceutical industry because they offer a way to alter the physical properties of a drug without affecting its therapeutic effects [1]. Furthermore, cocrystals offer an alternative to salts, hydrates and solvates, traditionally used by the pharmaceutical industry.

In this work, pyrazinamide, a first-line antibacterial drug used in monotherapy and also in combination to treat tuberculosis [2], was selected as a model drug to develop cocrystals on the basis of the synthon types by liquid-assisted grinding (LAG), using a series of GRAS (Generally Regarded As Safe) cofomers. Novel forms were synthesized and characterized by X-ray powder diffraction (XRPD) and Raman spectroscopy. Crystals suitable for single crystal X-ray diffraction were grown from the powder obtained by LAG method and the structures of these novel forms were solved.

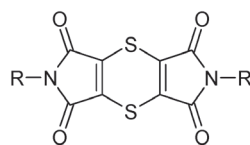
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Keywords: cocrystals; liquid-assisted grinding; pyrazinamide

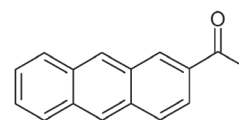
MS25-P4 Solid-state Diels-Alder Cycloaddition via Charge-Transfer Complexes: Reaction of N,N'-bis(propylimino)-1,4-dithiin with 2-acetylanthracene. Manuel A. Fernandes, Sanaz Khorasani, *Molecular Sciences Institute, School of Chemistry, University of the Witwatersrand, Private Bag 3, 2030 Johannesburg, South Africa*
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Solid-state chemistry involves the manipulation of molecules and materials through photochemical, thermal, and mechanical reaction methods. Solid-state reactions can be used for the creation of new materials by conversion of a starting reactant material to a desired product material that cannot be obtained through other methods. Combined with the wide variety of intermolecular forces present in crystals such as charge transfer interactions, d-d interactions and hydrogen bonding, solid-state reactions provide additional opportunities for materials design. A key feature of solid-state reactions is that the crystal lattice provides both stereo- and regioselective control of the reaction products obtained and the resulting crystal structures [1]. As a consequence, solid-state reactions can also be used to synthesise products which cannot easily be made by other methods.

Charge transfer complexes of dithiin compounds are known to undergo solid-state Diels-Alder reaction with anthracene to yield cycloadduct products [2-3]. This study is focused on the investigation of the thermal solid-state reaction of N,N'-bis(propylimino)-1,4-dithiin (PIDI) with 2-acetylanthracene. The first step involves growing charge transfer crystals of PIDI with 2-acetylanthracene in different solvents by various crystallization methods. Interestingly, the crystal structure of the CT complex contains two different charge transfer stacks, each with different donor to acceptor orientations. As a result two reaction sites are present and two different products are obtained upon reaction. Measurement of the unit cell at various stages of reaction indicates that it remains relatively unchanged by the reaction. In addition, analysis of the two reaction sites indicates that the molecules in these sites react at approximately the same rate. The solid-state reaction of the CT complex of PIDI with 2-acetylanthracene has also been investigated using hot stage microscopy. As the reaction progresses, the colour of the crystal changes from dark red to yellow while still retaining its ability to rotate polarized light. These results suggests a possible single-crystal-to-single-crystal (SCSC) transformation which is the focus of this study.



N,N'-bis(propylimino)-1,4-dithiin



2-acetylanthracene

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Keywords: solid-state reaction; charge transfer; thermal transformation