Poster Presentation

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Metal organic frame work of iron and urea

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Crystal engineering of cocrystals is heavily applied to improve solid-state properties of organic compounds. Cocrystallization is very useful in advancing relevant physicochemical properties such as bioavailability and hygroscopicity [1]. On the other side, mechanochemistry assists coupling of mechanical and chemical phenomena on a molecular scale [2]. This method eliminates the need for many solvents and hence the approach could help make many chemical processes used by industry eco-friendly. Fundamentals and applications of mechanochemistry are reviewed. It is noteworthy that cocrystallization often brings beneficial changes in heat stability, compound fastness, and solubility. The advantage of such an approach lies in the opportunity to produce compounds with new properties rapidly and without the need to utilize environmentally unfriendly, labour- and cost ineffective retrospective molecular modifications. In the present study, salts of iron (FeCl2, FeSO4) and urea were subjected to solvent assisted mechano grinding. It is found that new solid forms are formed at room temperature. Powder XRD analysis has shown that major peaks of urea disappear or shift during the process of mechano grinding, and this confirms that a new binary solid form comprising of iron and urea is generated (Fig.1A-B). Further, it was noticed that melting point of binary system shifted to a higher temperature than urea but lesser than that of Fe compounds (Fig. 1C-D). This result indicated ionic cocrystalline nature of the urea – iron system which has usage in the development of high energy materials and metal nitrides.

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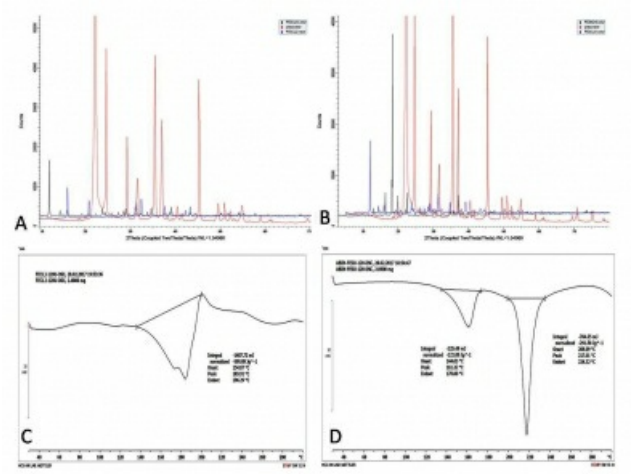

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