

Mechanically Induced Reactivity of Molecular Crystals: Chemistry (almost) without Solvents

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Reactions between solids, such as those activated by mechanical co-grinding of different solid materials, or those between a solid and a gas, are attracting the interest of scientists engaged in the quest for sustainable chemical processes. In Bologna we have been actively involved in the exploration of solvent-free mechanochemical reactions as a means to prepare novel mixed molecular crystals. The basic idea is that molecular diffusion by contact between two molecular crystals can lead to formation of supramolecular bonds and co-crystals or adducts without solvent participation. Under this point of view solvent-free reactions between or within molecular crystals can be regarded as a *green way* to crystal engineering.^[1]

In this contribution we report that co-grinding of silver acetate with *trans*-1,4-diaminocyclohexane [H₂NC₆H₁₀NH₂] in 1:1 ratio generates novel one- and two-dimensional coordination networks based on Ag--[H₂NC₆H₁₀NH₂] coordination bond and on hydrogen bonds between the acetate anions and the bis-amine ligand. The bis-amine [H₂NC₆H₁₀NH₂] has been little exploited in crystal engineering experiments and only few examples are known of its use for the construction of hydrogen bonded adducts or coordination networks.

[1] Braga D., Grepioni F., *Angew. Chem. Int. Ed.*, 2004, **43**, 4002.

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