

## **1.11 Synthesis of Lattice Matched Organic Crystals for the Heteroepitaxial Growth of MNBA by Organic Molecular Beam Epitaxy**

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Hetero- and homoepitaxial growth of the electro-optic material MNBA on different organic and inorganic substrates has proven the importance of lattice-matched crystalline organic substrates. An extensive search of the electronic databases on the structure of organic materials (Cambridge Structural Database) resulted in only one good match; only the salt EDT (ethylene diamine terephthalate) offers lattice parameters commensurate to MNBA. This material has an additional advantage in a low-cost, one-step synthesis. A disadvantage of the EDT is the low solubility of the starting material and of the product in nearly every solvent, which makes the crystal growth out of a solution problematic. Experiments in a dilute water-acetone solution resulted in small single crystals, up to a few millimeters, which were used for preliminary growth studies of MNBA on this substrate.

Deposition of MNBA at the substrate temperature of 80°C resulted in oriented film growth on one of the planes of the EDT crystals. This is an encouraging result, since in addition to the good lattice match, EDT seems to interact with MNBA sufficiently to form adherent films of good quality. Growth of larger EDT single crystals is under investigation; this is essential for the orientation and preparation of substrates from this material.