1.13 Homoepitaxial Growth of MNBA by Organic Molecular Beam Epitaxy

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Homoepitaxial growth of the electro-optic material MNBA (4'-nitrobenzylidene-3-acetamino-4-methoxy-aniline) has been successfully demonstrated using the organic molecular beam epitaxy (OMBE) technique. Solution grown MNBA bulk crystals served as substrates. The growth was achieved by the evaporation of MNBA powder from a low temperature effusion cell in an ultra high vacuum environment.

The quality of the grown homoepitaxial films was found to depend critically on the substrate temperature, the growth rate, and the surface quality of the substrate. Substrates were cleaned in vacuum by a desorption procedure at 130°C. Optically perfect layers were produced at a substrate temperature of 80°C at growth rates not exceeding 0.3 Å/s. The corresponding effusion cell temperatures ranged from 175°C to 200°C.

The thickness of the grown layers was measured *in situ* by means of a calibrated quartz crystal thickness monitor; alternatively an interference microscope was used to determine the final thicknesses of the obtained films.

The successfull homoepitaxial growth of the organic MNBA is an important step toward monocrystalline heteroepitaxial organic thin films and their potential electro-optic applications.