

Recent progress in Electron Crystallography to Mesoporous Materials and Materials Synthesized in their Spaces

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Mesoporous(20 to 500 Å) silica materials have two structural characteristics: disorder on the atomic scale but distinct order on the mesoscopic scale. The materials are synthesized through the self-organization of surfactants, which is a key mechanism for producing the periodic structure on the meso-scale. We can obtain single-crystal structural information from a very small region by EM, and structural information is relatively free from local variation. Using electron crystallography for “phase problem”, we have (i) solved three dimensional structures of mesoporous materials at the nanoscale level, the size and shape of the pores and cages, their arrangements, and their connectivity, including sizes of openings, and (ii) characterized novel materials synthesized in their spaces. I will report the progress we have made in solving structures of these materials and also discuss the problem we will tackle for new hierarchy materials with orders in different length scale. I hope I will be able to talk another approach which is powerful method for structure solution of microporous materials(zeolites).

References

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