

PAST AND FUTURE OF ZEOLITE MATERIALS

Valentin Valtchev^{1,2}

¹Laboratoire Catalyse et Spectrochimie, Normandie University, ENSICAEN, UNICAEN, CNRS, F-14050 Caen, France

²The ZeoMat Group, Qingdao Institute of Bioenergy and Bioprocess Technologies, CAS, Laoshan District, CN-266101 Qingdao, China

E-mail: valentin.valtchev@ensicaen.fr

The zeolite materials have been diligently serving society almost 60 years. However, after serving more than half a century as heterogeneous catalysts, molecular sieves, and ion exchangers in a variety of industrial (Oil refining, Petro- and Fine- chemicals production, etc.) and environmental (exhaust gas treatment, heavy and radioactive ion sequestration, water purification) applications the molecular sieve zeolites face new challenges. These new challenges come with the societal demand for cleaner, safer, and sustainable technology.

The present lecture is devoted to the prospects of zeolites in light of the societal and energy challenges of the current time. Recent advances in the *in situ* and *post-synthesis* control of zeolite properties, with examples based on industrial relevant materials, will be revised. The advantages, disadvantages, and limits of the *in situ* and *post-synthesis* methods of zeolite properties control will be discussed. Amongst the objectives of the lecture is to anticipate future developments in the field of crystalline microporous materials and the place of zeolite in the energy transition.