Among the major applications of pervaporation membrane processes, organic separation from organic/water mixtures is becoming increasingly important. The polydimethylsiloxane (PDMS) is among the most interesting and promising membranes and has been extensively investigated. PDMS is an "organicelastomeric material, often referred to as "silicone rubber", exhibiting excellent film-forming ability, thermal stability, chemical and physiological inertness. In this thesis incorporation of nanosilicalite-1 particles into a PDMS matrix and effect of particle loading and temperature variation on membrane performance was studied. A strong influence of zeolite was found on the pervaporation of alcohol/water mixtures using filled PDMS membranes. The mixed matrix membrane showed high separation factor at higher zeolite loading and high flux at higher temperature.