Transforming the art of catalyst preparation into a science has been one of the major challenges faced by the catalyst researchers of all periods. The chemical reactions occurring in the solution state and in the solid state during catalyst preparation are extremely complex and are also poorly understood. Scientific knowledge on the ‘happenings’ of a catalyst synthesis can become the stepping stone towards the development of efficient catalysts or the improvement of the existing ones. Main theme of the present work is the consequences of using different precursors for the preparation of supported nickel catalysts.

The precursors used were bis(ethylenediamine) complexes of nickel(II) with varying counter ions. Migration of metal ions to the support structure is one of the crucial factors determining the activity and selectivity of supported catalysts and efforts were made in this study to determine the influence of counter ions on metal migration. The unsupported nickel complexes were subjected to almost the same heat treatment as in catalyst preparation and the properties of the product obtained were studied. The effect of these metal complexes on the macrodistribution of active species obtained by impregnation, on preformed catalyst support were also investigated. Furthermore an attempt was made to study the structure-activity correlations by carrying out the reactions like hydrogenation and dehydrogenation on these catalysts. In short the work presented in this thesis is a humble effort to add ‘a little input’ to the catalyst preparation science.