# LIST OF TABLES


| | |
|---|---|
| Table 1.1 | Past perspective in catalysis (Thomas, 1997) |
| Table 1.2 | Common type of catalyst in industry |
| Table 1.3 | Examples of heterogeneous catalyst system in industry [http://en.wikipedia.org/wiki/Heterogeneous_catalysis] |
| Table 1.4 | Comparison of advantages/disadvantages in homogeneous and heterogeneous catalyst systems (http://www.eolss.net-sampleAllChapter.aspx) |
| Table 2.1 | Selective oxidation reaction of hydrocarbon (Ertl G., 1997) |
| Table 2.2 | Chemical properties of acrylic acid |
| Table 2.3 | Reaction Parameters for Propene Oxidation |
| Table 2.4 | Producers, catalysts, processors and reactors to produce acrylic acid |
| Table 3.1 | List of chemical used |
| Table 3.2 | List of support used |
| Table 3.3 | List of gases and purity |
| Table 3.4: | Some initial conditions that can be followed for other similar products |
| Table 3.5 | Spray dryer operating conditions |
| Table 3.6 | Details of powder X-ray diffraction (XRD) |
| Table 3.7 | Layer thickness (h, in µm), from which 90% of the fluorescence radiation originates |
| Table 3.8 | Feed gas ratio for 12 Nanoflow reactors |
| Table 4.1 | Feed gas ratio |
| Table 4.2 | Catalytic performance of different preparation method on undiluted $Mo_1V_{0.3}Te_{0.23}Nb_{0.12}$ catalyst |
| Table 4.3 | Catalytic performance over different preparation method on diluted $Mo_1V_{0.3}Te_{0.23}Nb_{0.12}$ oxide catalyst |
| Table 5.1 | Readings of different measurements recorded for $Mo_1V_{0.30}Te_{0.23}Nb_{0.125}$ synthesis with in-situ LabMax |
| Table 5.2 | Summary of Raman band positions in aqueous solutions (Beato, A. Blume *et al*. 2006). |
| Table 5.3 | Lists of sample prepared |
| Table 5.4 | Phase composition compared to catalytic performance in undiluted MoVTeNb oxide system |

| | |
|---|---|
| Table 5.5 | Phase composition compared to catalytic performance in diluted MoVTeNb oxide system |
| Table 5.6 | Molar ratio of elements normalized to Mo for undiluted system |
| Table 5.7 | Molar ratio of elements normalized to Mo for diluted system |
| Table 5.8 | FTIR absorption band position and their assignment for samples prepared |
| Table 5.9 | Band position for reference transition metal oxide |
| Table 5.10 | Surface area for undiluted and diluted catalyst |
| Table 5.11 | Purpose of DSC and TGA techniques |
| Table 5.12 | Weight loss at various steps and temperature under air flow as obtained from the thermal analysis data |
| Table 5.13 | Weight loss at various steps and temperature under argon flow as obtained from the thermal analysis data |
| Table 5.14 | DSC temperature profiles for all undiluted and diluted MoVTeNb oxide catalyst |
| Table 5.15 | Total number of oxygen atoms removed from the catalysts by hydrogen and labile oxygen |
| Table 6.1 | List of samples MoVTeNb samples selected for surface modification |
| Table 6.2 | *Rieveld* quatification analysis for non-leached and leached in different solvent |
| Table 6.3 | Elemental composition for leaching samples |
| Table 6.4 | Quantitative analysis for undiluted and diluted leached in $H_2O$ for 1 h and 24 h by TOPAS. |
| Table 6.5 | XRF analysis of undiluted and diluted MoVTeNb oxide catalyst before and after surface purification. |
| Table 6.6 | Phase composition and catalytic performance of MoVTeNb oxide catalyst |