Bibliography of Recovery of Metals from Spent Industrial Catalysts (Status at the beginning of the current Millennium)

a report on the book by
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This is a book published by the Asiatic Society, 1, Park Street, Kolkatta 700 016.

Processing of spent catalysts for winning their metal values except for some noble metal based systems was in its infancy even fifty years ago. Most frequently used metals in the catalysts are critical ones such as cobalt, nickel, molybdenum, vanadium, copper etc in addition to the noble metals. However there have been discouraging factors in the way of taking up the processing of spent catalysts for their metal values. Some of these are:

1. **Source raw materials are spread over a wide area**
2. **Transportation problems**
3. **Uncertain availability as life of a catalysts varies**
4. **Changing composition of a catalyst (even for a particular chemical reaction)**
5. **Non-availability of standard processes for treating spent catalyst (unlike those for ores).**

In spite of these factors, there are always some driving force for the recovery of metals from spent catalysts. Some of these factors are:

1. **Conservation of natural resources**
2. **Lower cost of the recovered metals compared to the virgin metals**
3. **Non-availability of the metals indigenously**
4. **Higher disposal cost due to anti-pollution regulations**
5. **Shortage of disposal sites**
6. **Minimizing environmental pollution**
7. **When recycled for the preparation of the same catalyst system, normally metals need not be recovered in the purest form thus reducing the process-steps and the cost of production to a large extent.**
8. **Scope for establishing small scale and ancillary industries.**

This bibliography contains about 1800 entries with 450 journal articles and the remaining are patents taken from about 120 scholarly journals. However for once the USA is not the leading in the recovery of metals (at least non noble metals) from spent catalysts. An analysis of the patent literature shows that out of the 1300 patents Japan leads with 372 followed by USA 207, German 163, erstwhile Soviet Union 104 and so on . A graphical representation is shown in Fig.1.

In spite of all these analysis the author still states that in spite of this encouraging trend in the matter of processing spent catalysts, many users despite liability risks (of violations of regulations) would still throw away significant amount of spent catalysts for land-filling.

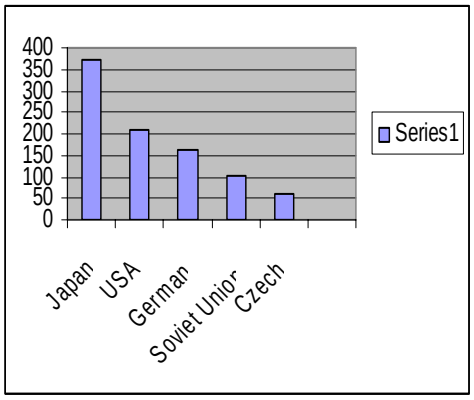

Fig.1. Patents coved by different countries for recovery

Metal wise analysis shows that Ni (240), V (99), Mo(87) and Cu (85). This data is graphically shown in Fig.2.

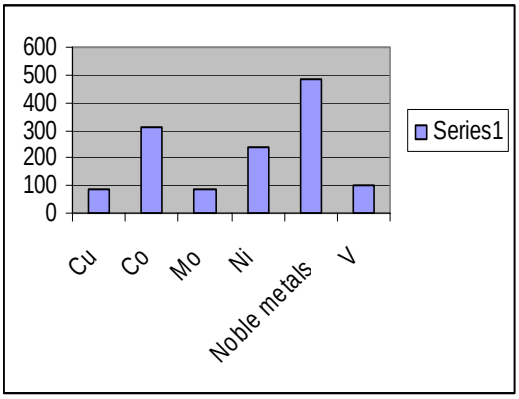

Fig 2. Distribution of publications on the basis of metals

Year wise publication from 1953 - 2000 on reprocessing of spent industrial catalysts is also shown in Fig.3.

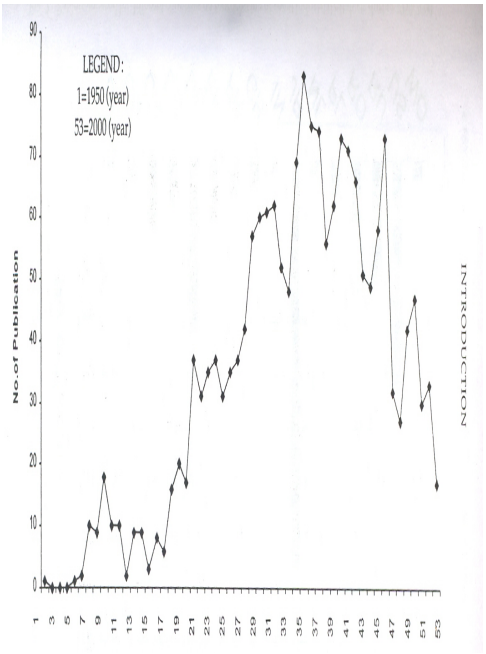

Fig.3. Year wise number of publications from 1950-2000 on reprocessing of spent industrial catalysts.

This book is an important contribution for the catalyst community in India and hope this book will attract the attention of the catalysts chemists in this country.

The Catalysis Society of India is grateful to the author for so kindly supplying the book to the society.