

## **IDENTIFICATION OF INDUSTRIAL HAZARDOUS WASTES IN TEHRAN AND VARIOUS METHODS OF THEIR DISPOSAL**

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**Key words :** *Hazardous waste , Management , Tehran , waste*

### **Abstract**

There are enormous quantities of unknown composition of hazardous wastes in Tehran without any control, safe disposal and treatment. This study was done to identify hazardous wastes and to control this wastes by establishing a treatment, storage and disposal facility. According to available statistics there are 4461 different industries in Tehran, out of which sample were chosen each having over ten employees(5). From the data collected, the quantity of liquid , solid and semi-solid industries hazardous wastes was 149050 tons all together . Of the mentioned total waste, a ratio of 46.64% is toxic, 30.84% is corrosive, 1.73% is ignitable and 20.79% of the waste shows other characteristics.

About 40.83% of the produced waste is transported to the municipality site, 1.72% is incinerated against sanitary regulations, 1.96% is recovered or recycled, 37.19% is landfilled in place other than municipality site and some other wastes are disposed by unauthorized methods.

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## **Introduction**

Hazardous wastes are generated from a wide range of industrial, commercial, agricultural and even domestic activities. Hazardous wastes can include solids, liquids, gases, sludge, containerized gases of contaminated containers. Hazardous wastes have only come to be recognized as a priority problem over the past 10 to 15 years. Hazardous wastes can cause immediate and short term public health problems, as well as long term environmental pollution. It is important that all developing countries should institute controls over hazardous wastes to avoid excessive costs in the future [2,18,19,20].

### **Definition of Hazardous Wastes:**

In the last few years, considerable attention has been focused on the question of what constitutes hazardous wastes. The U.S. Environmental Protection Agency has defined a waste to be hazardous, under the existing legislation, if it meets one or more of the following criteria[3,4,6,11].

Exhibits characteristics of ignitability, corrosivity, reactivity or toxicity.

Is a nonspecific source of waste (generic waste from industrial process).

Is a specific commercial chemical product or intermediate.

Is a mixture containing a listed hazardous waste.

Is a substance that is not excluded from regulation under resource conservation and recovery act subtitled C.

The following definition of hazardous waste was prepared under UNEP by the Ad Hoc group of experts on the environmentally sound management of hazardous wastes in December 1985:[1,8,9,18].

" Hazardous wastes means wastes other than radioactive wastes which by reason of their chemical reactivity or toxic explosive, corrosive or other characteristics causing danger of likely to cause danger to health or the environment, whether alone or when coming into contact

Each character represents one of the above questions. Then the database took the following form:

<u>Name :Tehran Refinery waste</u>	<u>Quantity</u>	<u>ID.Code</u>
SPI Sludge	7900 t/y	QFPTAIM
Slops Oil	2900 t/y	MLTTDII
DAF Floats	6200 t/y	QSTTDIP
Bottom Sludge of Crude Oil Tank	2 t/y	MFTTAIP
Heat Exchanger Cleaning	26 t/y	DSTOWIM
Ing. bundle Solids		

## Discussion

With regard to the collected data quantities of solid, liquid and semi-solid industrial hazardous wastes is assumed to be 149,050 tons. According to the data, the percentage of various industrial activities in generation of industrial hazardous wastes are as follows:

- food processing 2.62%
- textile, clothing and leather industries 1.48%
- chemical production 53.67%
- non- metallic mineral product industries 8.69%
- base metal producing industries 15.43%
- machinery, equipment and tool industries 18.11%

Of the mentioned total wastes, a ratio of 46.64% is toxic, 30.84% is corrosive, 1.73% is ignitable and 20.79% shows other characteristics. About 40.83% of the produced waste is transported to the municipality site, 1.72% is incinerated against sanitary regulations, 1.96% is recovered or reused, 37.19% is landfilled in the places other than municipality site and others are disposed by unauthorized methods (fig 1-6).

There are various quantities of hazardous wastes in Tehran without and control, safe disposal and treatment. To control these wastes a treatment, storage and disposal facility (TSDF) should be established.

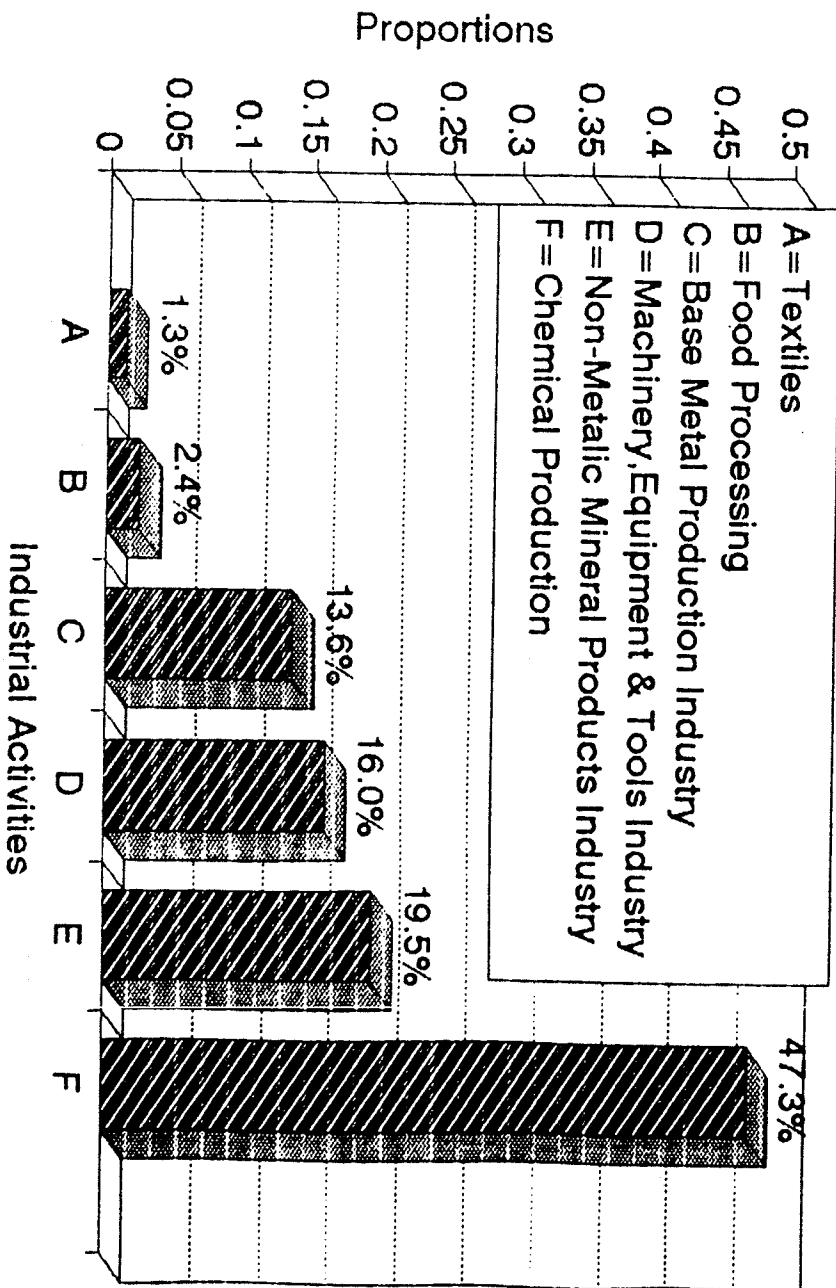


Fig.1- Percentage of Industrial Total Wastes Generated in Tehran

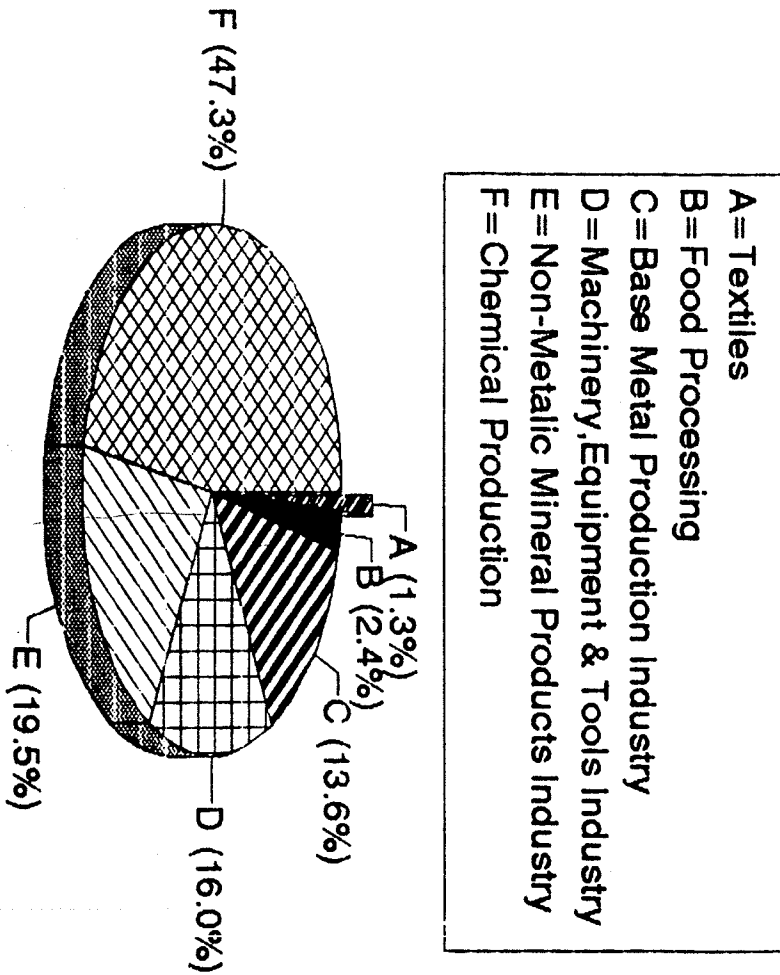


Fig. 2- Percentage of Industrial Total Wastes Generated in Tehran

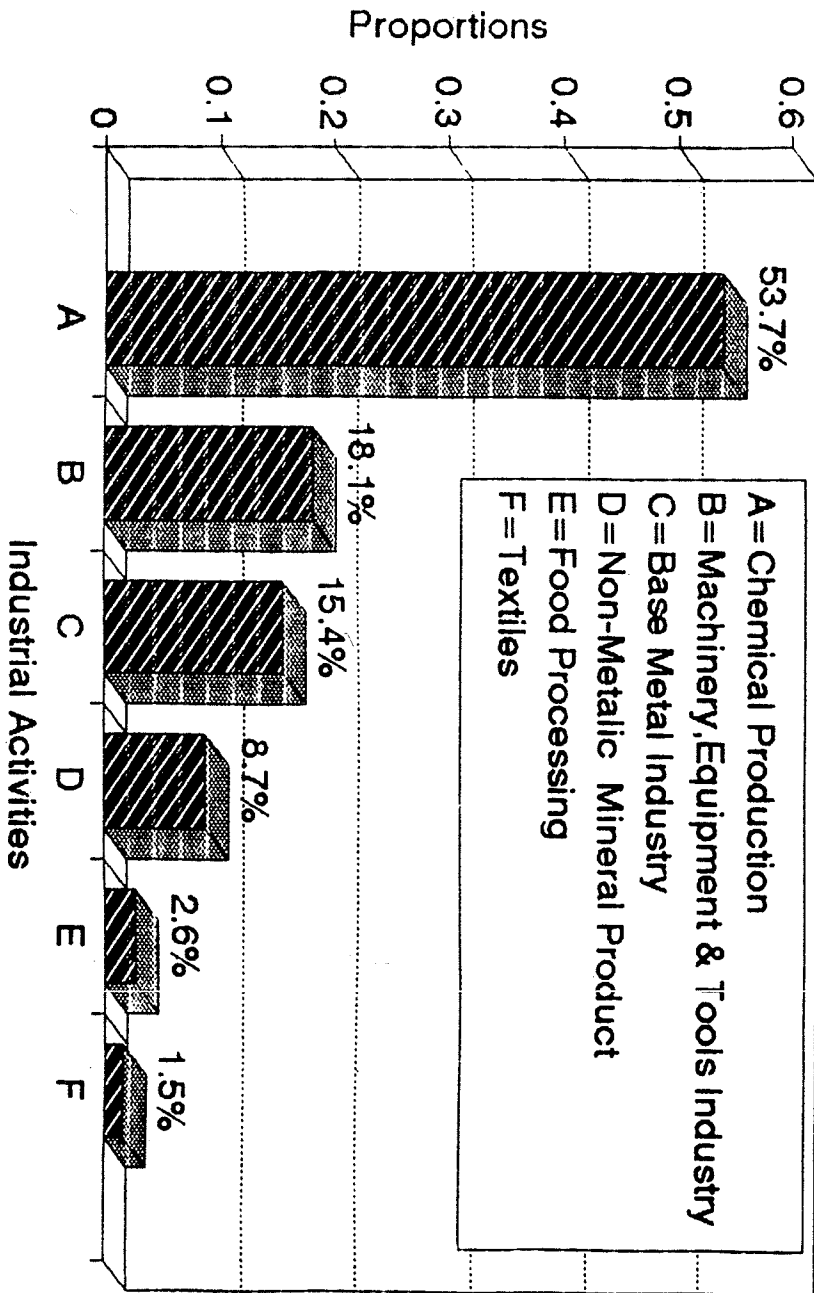


Fig. 3- Percentage of Industrial Hazardous Wastes Generated in Tehran

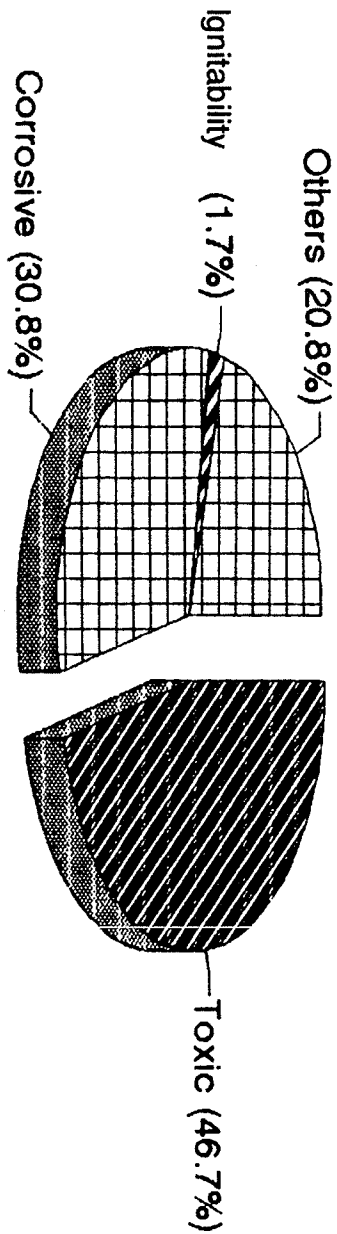


Fig 4- Characteristics of Hazardous Wastes in Tehran

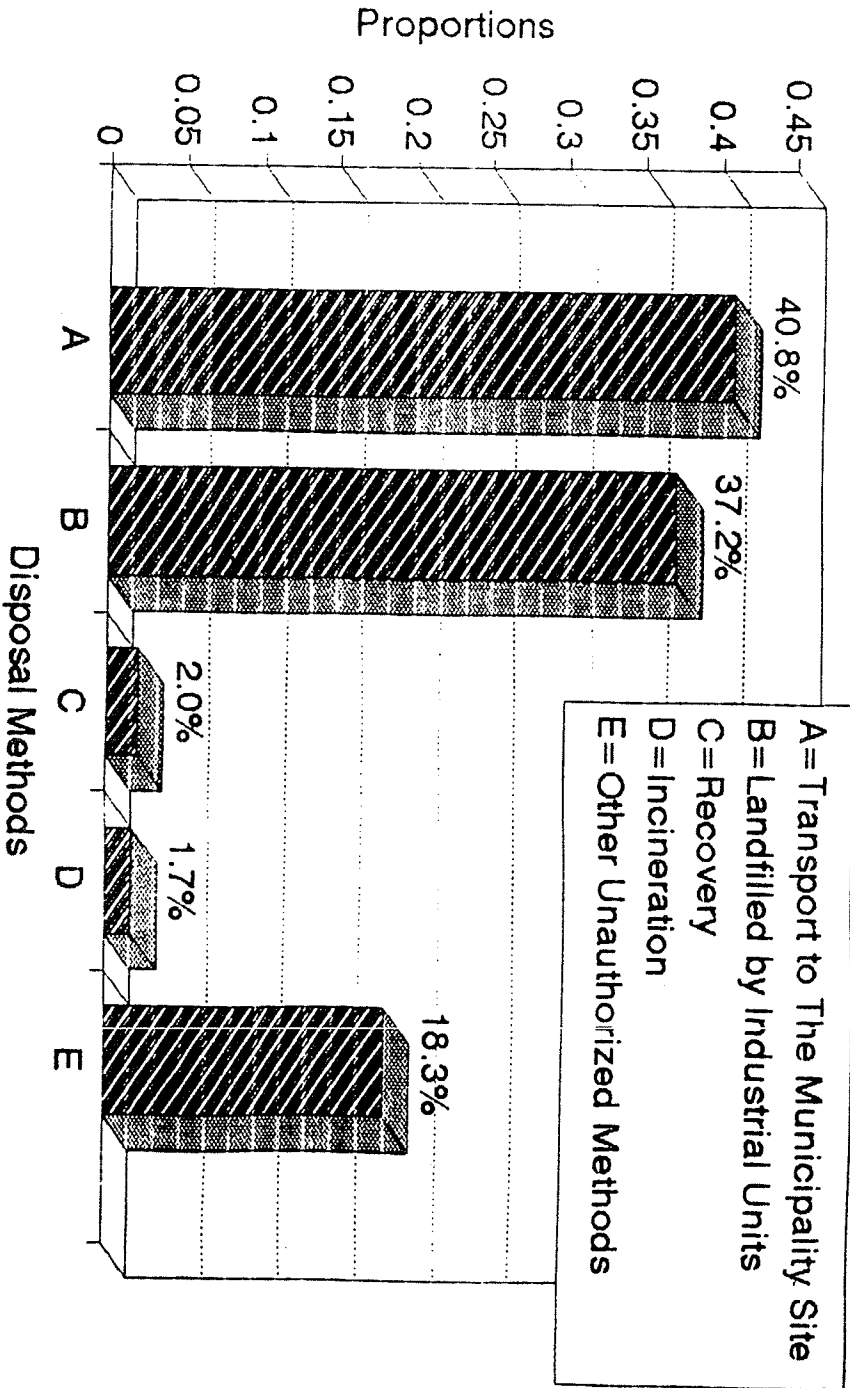


Fig. 5- Disposal Methods of Hazardous Wastes in Tehran



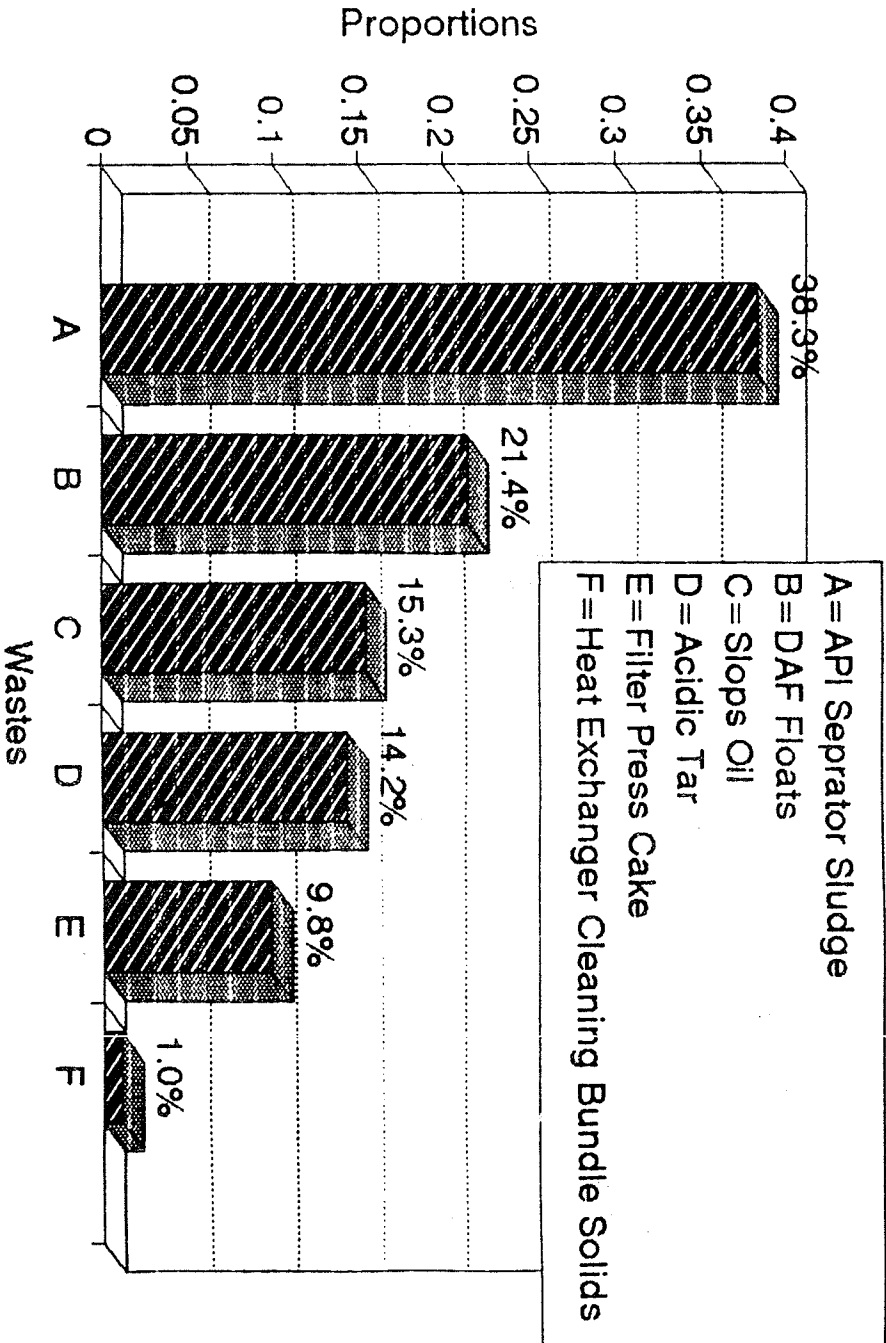


Fig. 6- Percentage of Hazardous Wastes Generated from Oil Industries

## کتابنامه

- 1- جونز، ادوارد، تیرماه (۱۳۷۱): راهنمای جامع فاکس پرو ۲، مترجم، باغداداساریان، ادیک، چاپ اول، کانون نشرعلوم، تهران.
  - 2- چوبانوگلو، جورج (۱۳۷۱): مدیریت مواد زائد جامد، مترجم، مجلسی، منیره، چاپ اول، سازمان بازیافت و تبدیل مواد، تهران.
  - 3- عبدلی، محمدعلی (۱۳۷۱): سوزاننده ها و کاربرد آنها در حذف موادزائد، مجموعه مقالات سمینار بازیافت و تبدیل مواد، سازمان بازیافت و تبدیل موادشهرداری تهران.
  - 4- کاشانی، سیدامیررضا، شهریورماه (۱۳۷۱): مدیریت بانکهای اطلاعاتی، چاپ دوم، دانشگاه علم و صنعت ایران، تهران.
  - 5- مرکز آمار ایران، بهمن ماه (۱۳۷۰): نام و نشانی کارگاههای بزرگ صنعتی کشور، چاپ اول، چاپخانه مرکز آمارایران، تهران.
- 6- Anyinam, C., (1991): Transboundry Movements of Hazardous Wastes, International Journal of Health Services, U.S.A., Vol. 21, No.4, P. 759.
  - 7- Batstone, R., Smith, E. and Wilson (1989): The safe disposal of Hazardous Wastes, First edition, World Bank Technical Paper No.93, Vol.1,2,3, U.S.A.
  - 8- Boomer, B.A. and Thomas, P., (1988): Sampling Surveys of Hazardous Wastes, JAPCA, U.S.A, Vol.38, No.4, P.1426.
  - 9- Collins, P.J., (1981): Hazardous waste Dilema, First edition, Published by American Society of Civil Engineers, U.S.A.
  - 10-Corbitt, A.R., (1989): Standard Handbook of Environmental Engineering, Second Edition, Mc Graw Hill Publishing Co., U.S.A.
  - 11-Freeman, H.M., (1989): Standard Handbook of Hazardous Wastes Treatment and Disposal, First Edition, Mc Graw Hill Publication, U.S.A
  - 12-Glyn, H., (1989): Environmental Science and Engineering, First Edition, Prentic Hall Inc., U.S.A.
  - 13-Hollod, J. and Mc Cartiney (1988): Waste Reduction in the Chemical Industry, JAPCA, U.S.A, Vol.38, No.2, P.174.
  - 14-Leemann, E., (1988): Waste Minimization in the Petroleum Industry, JAPCA, U.S.A, Vol.38, No.6, P.814.
  - 15-Lindgren, G.F., (1989): Managing Industrial Hazardous Waste 4th Edition, Lewis Publisher, U.S.A.
  - 16-Lorton, G.A., (1988): Waste Minimization in the Paint and Allied Products Industry, JAPCA, U.S.A, Vol.38, No.4, P.422.

- 17-Porteous, A., (1985): Hazardous Waste , First Edition, Butterworth Pub., Great Britain.
- 18-Sarai, M., (1992): Strategies of Hazardous Waste Managment for Developing Countries, Proceedings of the 2nd Conference on Environmental Planning and Management , Tarbiat Modarress University , Tehran.
- 19-Sax, I., (1989): Dangerous Properties of Industrial Materials, 7th Edition, Vannostrand Renhold Pub., U.S.A.
- 20-Tajima, T., (1985): Quality of the Environment in JAPAN, First Edition, Environmental Agency Publication, Tokyo.
- 21-Tanara, T., (1981): Quality of the Environment in JAPAN, First Edition, Environmental Agency Publication, Tokyo.
- 22-UNEP., (1990): Storage of Hazardous Materials , First Edition , UNEP and IEO Technical Paper No.3, U.S.A.
- 23-Wentz, A., (1989): Hazardous waste managment, First Edition , Mc Graw Hill Publishing Co., England.
- 24-WHO (1983): Managment of hazardous Waste, Second Edition , WHO, England .
- 25-WHO (1973): Health Hazards of the Human Environment, Second Edition, WHO, Geneva, 1973.
- 26-WHO (1984): Guidelines for Drinking Water Quality, First Edition, WHO, Geneva.
- 27-WHO (1992): Cadmium- Environmental Aspects, First Edition, WHO, Geneva.
- 28-Young (1988): A.D., Underground Storage Tank, JAPCA, U.S.A, Vol. 38, No.4, P.62.