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### **Influence of chemical residue on the environmental engineering**

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#### **Abstract**

This review summarizes waste management and there is a need for better understanding the scientific findings for recycling the waste materials and suggests areas where further research is needed. In major cities around the world, waste management today is based on a comprehensive, sustainable and environmentally sound system of maximization. From this perspective you are one of the most important issues in urban management. From this perspective you are one of the most important issues in urban management. Therefore, a number of cities around the world have succeeded in achieving an integrated and efficient management to achieve this goal by designing and implementing a variety of programs using state of the art technology separation of origin, collection, transportation and processing mechanisms. The main components of a modern waste management system generally include production, collection, separation, recycling and disposal. Separation, processing and recycling may occur at any stage of waste stream management. Design and implementation of a comprehensive sustainable waste management system require consideration of different waste characteristics in the region. Today's humanity has been subjected to some form of consumerism. Lowering the quality standards for all types of goods and products, reducing, lowering some standards for quality control of goods, lacking serious quality control over products, increasing population, increasing consumer demand, diversifying goods, fashionable packaging, people's desire to buy product. Stylish and thousands of said and untold indices result in consumerism and the consequence of producing millions of tons of different types of waste that are produced on a daily basis.

**Keywords:** Environment, chemical residue, recycling of disposal, waste management.

#### **Introduction**

##### **Residue Management History**

The municipal residue management system as it is today. Emerges in the 1930s in industrialized countries until the 1970s residue was seen as a rubbish and in these ways there were numerous health, environmental and aesthetic disadvantages

due to technological developments and increased public awareness of new residue management systems in industrialized countries and others. Countries the world gradually developed. In these transformations, environmental issues and its political and economic conditions, issues such

as saving energy and materials and recycling them from municipal residue were taken seriously and over time, the residue processing and recycling process took a better place. Found among the residue management. In the 1980s the issue of sustainable development was raised and experts concluded that without considering the three economic, environmental and social aspects of the earth's limited resources, it could not be expected that future generations would meet the needs future generations. The beginning of solid residue management in Iran can be traced back to the establishment of the first municipality in the country in the 1290 year. Obviously, in Iran at that time like in the rest of the world. Residue was considered to be a waste material that was only needed to be removed from the environment. So, in the densely populated parts of Iran, the problems that were said were there (Statistics from Tehran Waste Management Organization, Wikipedia).

#### **Definition of Residue**

According to the Organization for Economic Cooperation and Development (OECD), residue is the inevitable materials of human activity that is not needed in the near future and that processing or disposal is necessary there (Statistics from OECD, Wikipedia).

The United Nations Environment Program (UNEP) defines Residue as things that their owners do not want or need or do not use and need to process or dispose there (Statistics from UNEP, Wikipedia).

Residue is a by-product of human activities, physically residue contains the same substances that are useful in products and their only difference is the residue. In many cases this residue is due to the mixture being

unknown. Separation of residue material can be one of the ways to increase the value of materials and find applications for them. In general, there is an inverse relationship between the amount of residue mixture and its value. Household residue has always been a complex issue in the management of cities. Due to the range of materials in this residue (glass, metal, paper, plastics, organic materials) and the complete disruption of these materials, there are numerous problems in their management. The composition of residue also varies in different seasons in different geographical areas from country to country and from city to city and these factors prevent a single version for all cities to be complicated. Commercial and industrial residue is usually produced more uniformly and in higher quantities so a management system that can handle household residue is definitely capable of managing residue from other sources as well there (Statistics from OECD, Wikipedia).

#### **Classification of type residue**

##### **Normal residue**

All residue that is normally produced by people's daily activities in cities, villages and outside such as household residue and construction residue.

##### **Medical residue (Hospital)**

All infectious and harmful residue from hospitals, health centers, medical laboratories and other similar centers is referred to other hazardous hospital residue is out of the definition.

##### **Special residue**

Residue are said to require special care due to the presence of at least one of the hazardous properties such as toxicity, pathogenicity, explosiveness or flammability,

corrosion and the like including medical residue as well as part of normal industrial residue. Farmers who need special management are special residue.

#### **Agricultural residue**

Residue resulting from agricultural production activities such as waste, animal carcasses (livestock, poultry, aquifers) perishable or non-consumable agricultural products.

#### **Industrial residue**

All residue from industrial and mining activities and refining waste from the oil, gas, petrochemical and power plants and the like such as scrap, crushing and industrial sludge.

#### **Wet residue or organic or perishable**

Such as food residue, fruit skin, etc.

#### **Dry residue or inorganic or non-corrosive**

Metals, paper, glass, plastic, etc.

#### **Special and hazardous residue**

Waste from various industries, hospitals and household hazardous residue such as batteries, razors, fluorescent lamps, varnishes, etc. The presence of various constituents in municipal residue and food waste and factors such as heat humidity make it a suitable environment for the proliferation of all kinds of bacteria, viruses, parasites and pathogens and some insects especially insects and rodents especially the mice.

This causes inaccurate dumping of generated waste and the use of a variety of unscientific and non-engineering disposal methods causing serious and sometimes irreparable environmental and health hazards.

The use of meat, dairy products and skins of

contaminated animals that feed on municipal waste products in urban rubbish causes human and animal diseases to become more common for example diseases such as Brucellosis, Leptospirosis, Hydatidosis, Pestic and these that are rapidly proliferating and spreading due to the lack of control of urban and rural waste and scientific and engineering planning for their collection and disposal and may result in acute epidemics.

Insects like flies by physically transmitting many bacteria, viruses and parasites can cause human diseases such as trachoma, deadly diarrhea, protozoan diseases, fungal diseases and various food poisoning. According to studies and research, proper control of waste production and proper management and engineering programs for waste can be up to 90% in control of growth, propagation and breeding of flies and 60% to 65% in control of overcrowding. Mice be effective about two types of diseases known to humans are attributed to animals such as dogs, mice, cats and various insects there (Chubanglus, 2009).

#### **Different motivational methods for public participation and more effective in separating residue at source**

Citizens will be offered one of the following services if they provide dry residue:

1. Payment of cash, proportional to the price of the day of disposal of waste delivered to the citizens
2. Providing a credit card commensurate with the economic value of the waste delivered by the citizen and charging the credit card after each dry residue delivery
3. Thanks to the citizens who made an effective contribution to the collection of dry waste at source
4. Donation of functional goods such as garbage, all kinds of stationery, all kinds of

environmentally friendly detergents and cleaners and renewable (Abduli, 2006).

### **Types of recycling**

Recovery usually has two meanings, first the reuse of materials such as soda glass or milk bottles that return to the consumption cycle after washing and second the recycling of waste into the product during various stages and operations become new and return to the consumption cycle for example old-fashioned plastics used for decoration or broken used aluminum scraps that have been melted back into beverage cans and refilled at the factory for consumption returns.

### **Primary recycling**

Introducing a second-hand material into the production line in a way that could produce a similar product such as returning steel crumbs to new steel furnaces.

### **Salvage**

The process of obtaining second-hand materials is through the collection of residue and the collection of waste materials or more clearly, the purpose of recovering salvage to all material recovery activities and utilizing them in the necessary processes.

### **Reprocessing**

From the production of a secondary material caused by the deformation of the raw materials such as the conversion of cellulose to alcohol by hydrolysis.

### **Secondary material**

Are substance that are fully used and can not be used in the same after use.

### **Secondary recycling**

Using a second-hand material for a first-purpose is like turning a newspaper into

another packaging such as an egg comb.

### **Recyclable materials**

The most valuable recyclable materials in municipal rubbish are all kinds of metals but other materials such as bone, paper, cardboard, cartons, textiles, plastic, even pet, skin and hair are slaughter waste, types of colored and plain glass, rubber, wood waste and food waste there (Rayner, 2011). Mixed or compound, the product is a biological process of deformation of organic matter into stable materials by the large number of thermophilic aerobic microorganisms within the waste mass in the vicinity of heat, moisture and oxygen during the fermentation process, the pasteurization process is carried out by generating a heat 60 to 70<sup>0</sup>c eliminating pathogens and any contamination in the compost there (Omrani, 2010).

### **Tips on the environmental recycling process**

If we recycle paper from scarp and waste paper, we save 90% water, 50% energy and 75% air pollution. You get 45 kg of paste out of every 34 kg of scarp paper. By recycling an aluminum can the amount of energy required to keep the TV running for 3 hours is saved while producing an aluminum can has to be five times as much energy. One liter of oil can poison and contaminate 10000 square meters. The annual cost of warming due to greenhouse gases can be as high as 3% of global. You get 70 types of rubber recycling products such as tube, flooring, bridges and asphalt lining, sports field parquet, belts, rubber floors, shoe floor, car brake, hoes, cable, pipe. 35% of the plastics consumed at the rubber injection plant are scarp and discarded.

Batteries provide consumers with 1 of their stored energy. 10% of Tehran waste is plastic

and paper which means approximately 200/000 tons per year. In the city of Tehran, the dumps of food waste and garbage are discarded at a rate of 1/600/000 tons per year. Each ton of garbage produces 340 kg of compost fertilizer IE 700/000 of compost is produced annually. If only one day of the week, one of the major newspapers is recycled, the tree will be cut down. In the United State the cost of recycling is 35 \$ per ton of waste while the cost for burying it is 80 \$. With the energy contained in one ton of waste, it held 600 cubic meters of water for 12 hours at 23<sup>0</sup>C or provided 15 kilometers of road lighting there (Rayner, 2011).

#### **Suture of industrial and hazardous residue characteristics**

1. It is not easily degradable and is generally stable.
2. If appropriate, the environment will multiply and increase the rate of contamination. They are gas, solid or liquid and can cause deaths and discomfort due to their low concentration or physical, chemical and biological quality.
3. Explosive
4. Flammable
5. Radioactive
6. Chemical
7. Corrosive
8. Toxicity

The volatility of these chemicals and toxins causes it to spread widely in cities and the environment and can increase the severity of human respiratory diseases and its adverse effects through the air, their degree of danger is measured by their destructive forces and the consequences of their uncontrolled and incorrect targeting and other criteria such as Pytotoxicity or Bio-concentration the amount of tissue accumulation in a living organism can also be

classified into their hazards there (Report on the Reduction of Waste Source in Tehran, 2009).

#### **Two important points in collecting industrial waste**

1. If they are liquid, they should not enter the municipal sewage collection network. If they are explosive and flammable, they must be collected separately from other industrial wastes.

Almost all industries produce hazardous waste materials. The chemical industry ranks first with more than 60% of their total waste production-

1. Metal industries 10%
2. Petrochemical industries 5%
3. Electrical industries 3%
4. Paper manufacturing 3%

#### **Some methods of treatment and disposal of industrial and hazardous residue-**

1. Incineration
2. Landfill
3. Chemical, Physical, Biological Treatment
4. Recycle
5. Neutralization
6. Minimize Toxicity
7. Store
8. Storage in abandoned polar glacier mines, deep seas and oceans

#### **Some ways to reduce waste production**

1. Do not use utensils, disposable goods or products as far as possible
2. Use more durable and durable goods and products of higher quality as they always have higher quality meaningless waste generation
3. Use hand basket and cloth instead of nylon.

**Table 1. Name of the Industrial Waste (Waste Management Process in Iran and World, 2013).**

Products	Potentially Hazardous Waste
Plastics	Eli chlorine compounds
Insecticides	Chlorides, chlorine phosphates
Pharmaceuticals	Solvents, heavy metals, pharmaceutical waste
Paints	Heavy metal, organic solvents, colored substances
Oil and gasoline	Phenols, benzene, lead, organic solvents
Metals	Fluorides, cyanides
Leather	Cream, Aldehydes, solvents
Textiles	Heavy metals, dyes, fibers
Paper	Hydrogen sulfide, Mercaptans, mercury, fibers

**Table 2. Worldwide Waste Disposal Methods (Source: World Bank Report, 2012).**

Country	Heap	landfill	Compost	Material Recycling	Energy Recycling	Remainder
Australia	-	69/66	-	30/34	-	-
Austria	-	6/75	44/72	26/54	21/1	0/9
Canada	-	-	12/48	26/78	-	60/74
Chile	-	100	-	-	-	-
Italy	-	54	33	-	12	-
Japan	-	3	-	17	74	6
Korea	-	36	-	49	14	-
Netherlands	-	2	23	25	32	17
Spain	-	52	33	9	7	-
Sweden	-	5	10	34	50	1
Swiss	-	1	16	34	50	-
Turkish	66	30	1	-	0	3
UK	-	64	9	17	8	1
USA	-	54	8	24	14	-

4. Many of the items and goods used can be suitable for use by other people. They are not simply discarded and can be repaired and provided to others in need if they are properly used and healthy

5. Converting some materials to other reusable materials such as making orange peel jam from orange fruit waste or turning pieces of fabric into forty pieces, etc.

6. Use rechargeable electrical and electronic products such as rechargeable batteries, etc.

7. Learn and practice waste reduction techniques and teach others (Report on the Reduction of Waste Source in Tehran, 2009).

#### **Environment Impact Assessment (EIA)**

Environmental assessment is a tool for assessing the negative consequences of the project and identifying remedial measures to optimally utilize natural and abnormal resources and promote the national economy. Environmental assessment objectives the environmental impact assessment studies have two long-term and short-term objectives as follows-

#### **Short-term goals**

Determination of appropriate corrective actions and inclusion in the project plan project forecasting of significant and

sustainable environmental impacts determination of characteristics of significant and unforeseen environmental impacts determination of project environmental revenues and costs.

#### **Long-term goals**

Evaluate all the consequences that the proposed development project will have on the environment whether private or public.

#### **Interpretation of the necessity of evaluation**

The environmental assessment report is an important document for sustainable development because by providing a project environmental assessment report, it is possible to give nature and ultimately the environment what is happening in nature to be environmentally sound.

#### **Necessity of environmental assessment:**

The development of the country's development and its environmental concern are derived from laws that directly or indirectly require economic activities to comply with certain environmental issues there (Mirabzadeh, 2009).

#### **Conclusion**

We need to raise our sense of responsibility for some of the most important issues in our personal and community life including health and the environment and not be indifferent the health and environment of our city and country. Learn ways to reduce waste production. Avoid extravagance. Not everything is useless waste and waste is not just a waste. It can be valuable and reusable and even some of its components can return to the cycle of consumption by adhering to health and environmental standards and etc. health and environmental protection are legally

essential for everyone. It is never too late to learn and correct culture and some of the wrong behaviors. Proper and effective training, albeit continuous, can lead to a healthier environment and sustainable development. We all need health and environmental education in every job whatever level of education we have. Take the active, effective, public participation in the separation of waste at the source and continue to work hard and urge others, friends, neighbors, classmates and academics to do the same. Most materials that are made today must be environmentally friendly as well as renewable and non-destructive. These materials are a priority in the world with these features that people around the world must support and use to make them less sustainable harm the environment.

#### **Conflict of interest**

Authors declare that there is no conflict of interest.

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