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THE PRESENCE OF HEAVY METALS IN USED CLOTHES AND THEIR IMPACT ON HUMAN HEALTH

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Abstract: The research aims to detect the presence of heavy elements in used clothes and to educate people about their dangers and the diseases they carry in order to provide some solutions and recommendations for this problem. To achieve this goal, laboratory tests (atomic spectrometer) were conducted, which included 12 samples from different areas of Diwaniyah Governorate on 2/2/2021. The samples came in varying proportions. The percentage of arsenic increased in the intersection street by 30% and decreased in Alawi Street by 25%. As for the cadmium element, its concentration increased in Alawi Street by 20% and decreased in Alawi Street by 10%. As for lead, its percentage increased in the intersection street by 15% and decreased in Alawi Street by 10%. This difference is due to the presence of a fuel filling station behind the intersection street, so the percentage was greater. The quality of the clothes was estimated to be low, bad and dangerous to human health. Therefore, we recommend the necessity of carrying out sterilization operations and increasing monitoring of the places of their import and display to ensure the efficiency of the treatment and sterilization facilities

Keywords: -

Introduction

It is well known that clothing has great importance in human life and this role is not limited to merely covering the body parts, but extends to include many aspects and the most important basic requirements are that it be suitable for human nature and work to protect him from any health damage or microbial infection (Zakaria, 1998). Recently, the trade in used clothes has appeared and spread widely, especially among the middle and poor classes, where it is displayed on the sidewalks due to its importance from the economic aspect. (Baden et al, 2005) This phenomenon has continued and is constantly increasing and expanding and has become global, but it is more widespread in poor countries (William, 2007). Because these used clothes are useful to consumers in developing countries because they get them at a lower cost than they get from local production or imports of new clothes because they provide them with low-cost clothes for those living in poverty (Baden at al, 2005). Developing countries are the main importers of this type of clothing and the most important exporters of this trade are Germany, Canada, Belgium and the Netherlands. These clothes are exported in three ways as charitable non-governmental organizations, communication groups and commercial banks (Bazzy, 2012). The danger of used clothes lies in the fact that they are transferred from one hand to another and thus they carry with them many things that come from the original source of the clothes or that come to them during storage and transportation. These include chemicals such as factory dust, preservatives and disinfectants, and these clothes have the distinctive smell of used clothes. Among the things that used clothes carry are insects, parasites, viruses and bacteria, many of which can resist disinfection methods as a result of their formation of dormant phases that resist difficult conditions and which can reactivate once worn. (Al-Shabli, 2013). The value of used clothes lies in their low value and availability at a cheaper price, and the price for the poor is the decisive factor in this. People may have the desire to buy new clothes, but they are expensive for them (Brooks, 2012). This trade has also helped provide job opportunities and create jobs for some residents, and it has become a good source of income. In addition, these clothes have helped many low-income families to buy most of their clothes (Baden et al. 2005). It has been found that income plays an important role in choosing clothes, unlike individuals with high levels of income who have the ability to save money compared to individuals with low income who may have other more important family needs such as health, food or shelter (Tweten, 1980). The reason for the increased tendency of consumers to use used clothes is a significant increase in the prices of new clothes, which is met by a noticeable and inexpensive decrease in the case of buying used clothes (Mohamed, 2018). Therefore, the positive and negative aspects of using these used clothes must be identified, and consumers must be educated about what should be followed regarding this type of clothing (Al-Tantawi, 2012).

Methods

Samples Collection: The study included collecting samples of used clothes from the bale shops located in the markets of the city of Diwaniyah, with 12 samples randomly on 2/2/2021 from the bale markets in Diwaniyah, where each sample was placed in an unused nylon bag and then the bag was closed directly and transferred to the laboratory for examination.

Method of work

Digestion stage/

-1After taking a sample weighing (1 g) from each sample after weighing it with a sensitive balance, the digestion process is carried out using the (APHA) method.

Analysis stage/

After the digestion period is over, the samples are analyzed using an Atomic Absorption Spectrophotometer with a wavelength of 228.8 to examine the concentration of heavy elements.

1- 3-Introduction to the device

The atomic absorption device is used to identify mineral elements and estimate their concentration in their solutions. The idea of the device is to convert the material into atoms by means of a heat source and then expose it to rays of a single wavelength that are distinctive for each element and fall in the ultraviolet or visible range, where the atoms absorb an amount of these rays proportional to their concentration, and the absorbed rays are measured by a detector in the form of a photocell**.**

Atomic absorption spectrometer

Results and Discussion

Mean ± Sd

	Cd	As	Pb
Position 1	1.11±0.01	3.401±0.01	0.24±0.01
Position 2	1.2189±0.01	2.26±0.01	0.10±0.02
Position 3	0.4334±0.02	4.30±0.00	0.83±0.04
Position4	0.6501±0.01	1.89±0.01	0.25±0.01
Position 5	0.1083±0.01	3.72±0.01	0.38±0.01

*Least significant difference) 0.05<P

-Discussion

12samples were taken from used clothing stores in Diwaniyah Governorate (Intersection Street, behind which there is an oil station, Alawi Street, 6 samples from Intersection Street and 6 other samples from Alawi Street). In the 6 samples from Alawi Street, the concentration of arsenic was (3.4 Mg / g) dry weight, the concentration of cadmium was (1.1 Mg / g) dry weight, and the concentration of lead was (0.2 Mg / g) dry weight in the first place. As for the second place from Alawi Street, the percentage of arsenic was (2.2 Mg / g) dry weight, the concentration of cadmium was (1.2 Mg / g) dry weight, and the concentration of lead was (0.1 Mg / g) dry weight. As for the other 6 samples from Intersection Street, the concentration of arsenic was (4.3 Mg / g) dry weight,

the concentration of cadmium was (0.4 Mg / g) dry weight, and the concentration of lead was (0.8 Mg / g) dry weight in the first place. As for the second place, the concentration of arsenic was (1.9 Mg / g) dry weight, the concentration of cadmium was (0.6 Mg / g) dry weight, and the concentration of lead was (0.2 Mg / g) dry weight. In the third place, the percentage of arsenic was (3.7 Mg / g) dry weight, the concentration of cadmium was (0.1 Mg / g) dry weight, and the concentration of lead was (0.3 Mg / g) dry weight. The results did not exceed the permissible values in the air of arsenic (10 Mg), cadmium (5 Mg) and lead (0.15 Mg) as set by the Environmental Protection Agency. The results showed a large difference in the percentage of heavy elements. The percentage of arsenic was greater than cadmium and lead. This is due to the presence of large quantities of arsenic combined with the elements carbon, hydrogen, chlorine and sulfur. When these clothes are exposed to the atmosphere for a long time, the concentration of this element increases. After that, the percentage of cadmium is less than arsenic because this element is found in very low concentrations in nature and can be eliminated by sterilizing the clothes by heating. As for the percentage of lead, it is lower among the elements due to the lack of natural activities such as volcanic activity and geochemical weathering. The clothes were contaminated with elements (cadmium, lead, arsenic) and no percentage of nickel and copper was found because these elements are found in the solid parts of the clothes such as buttons and were not tested. As for phosphorus, no percentage was found because it does not react with the clothes, but it reacts when it comes into contact with the skin. Its danger lies in the cumulative effect of heavy elements in the body to slow down the progress of physical, muscular and nervous processes that cause some diseases such as Parkinson's and Alzheimer's. Moreover, long-term repeated contact with heavy elements or their compounds may lead to damage to amino acids and cause mutation and imitation of hormones, which leads to disruption of the endocrine glands and the reproductive system and ultimately leads to cancer. Comparing the two places, we find that the concentration of arsenic in the intersection street is higher, and the reason may be that these clothes have been on the street for a longer period of time, so they were exposed to more dust and dirt, and because the element is found in good concentrations in nature, as well as the oil station, it may have an effect in increasing the concentration of arsenic behind the street. As for the cadmium percentage, it was higher in Alawi Street, and the reason is that these clothes are randomly displayed on the street and are directly exposed to dust storms and dirt. Cadmium is also used to fix clothing dyes, or the reason may be in the incorrect storage and transportation method. We find that the concentration of lead in the intersection street was higher, and the reason is that lead comes from fuel stations such as gasoline and oil, and the oil station behind the street may be the reason for the lead contamination of the clothes, and also that these clothes are displayed on the street, so they are more susceptible to contamination through car exhaust and the fumes emitted from them. Handling used clothes without storing them in sterile bags, especially, makes them more susceptible to contamination through the transportation and storage process and chemicals such as factory dust and the materials with which they dust these clothes. (Al-Shabli, 2013) The accumulation of clothes for a long time and in places where there is no ventilation is considered a cause of clothing pollution, and smuggling is considered illegal, so it is not subject to monitoring and therefore dangerous and polluting.

Conclusion

1. Urging researchers to conduct similar research that is concerned with solving the problems of the ready-made clothing industry
2. Reducing production costs in the ready-made clothing industry so that we can face the fierce competition imposed by the used clothing markets

3. The government supports the industrial sector in general and the ready-made clothing industry in particular
4. Raising general awareness among consumers about the health and environmental risks of used clothing through the media and newspapers
5. The government raises taxes on shops that sell used clothing and prevents vendors from occupying sidewalks.
6. Clothes must be sterilized and washed well.
7. We conclude that used clothes are not clean and unfit for use and cause many health problems.
8. Among the dangerous things that used clothes transmit are viruses, insects, parasites, their eggs, bacteria and fungi, which cause serious skin and respiratory diseases for humans.

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