وزارة التعليم العالي والبحث العلمي

جامعة القادسية

كلية العلوم

قسم علوم الكيمياء

Industrial pollution on the environment

بحث تخرج مقدم من قبل الطالبتان

منى ابراهيم و نجلاء عواد

الى قسم علوم الكيمياء / كلية العلوم/ جامعة القادسية كجزء من متطلبات نيل شهادة البكالوريوس

بإشراف الأستاذة

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١٤٣٩هـ ٢٠١٨م

بسم الله الرحمن الرحيم

﴿وَقُل رَّبِّ زِدْنِي عِلْمًا﴾

صدق الله العلي العظيم

سورة طه : ١١٤

شكر وتقدير

بدأنا بأكثر من يد وقاسينا أكثر من هم وعانينا الكثير من الصعوبات وها نحن اليوم والحمد لله نطوي سهر الليالي وتعب الأيام وخلاصة مشوارنا بين دفتي هذا العمل المتواضع

أتقدم بخالص شكري وامتناني إلى عمادة كلية العلوم /رئاسة قسم علوم الكيمياء في جامعة القادسية لإتاحتهم ألفرصه لي لإكمال البحث , كما أتقدم بخالص الامتنان إلى أساتذتي الكرام وبالأخص الأستاذة الفاضلة **((د .زينا))**

للمساعدة السديدة والملاحظات الدقيقة التي لولاها لما اكتمل البحث . .

كما اشكر زملائي وزميلاتي للأيام الجميلة التي قضيناها معا

الى كل من ساعدني في معلومة أو نصيحة

لكم مني كل الحب والتقدير

الإهداء

إلى الحبيب المصطفى محمد صلى الله عليه وآله وسلم

إلى الذين وجوههم لغير الله ما توجهت ... وأقدامهم لغير الله ما سارت ... إلى

كل من في الوجود بعد الله ورسوله والأئمة الميامين ..

الى نبع الحنان والدتي

الى القلب الكبير والدي

الى عائلتي

إلى من كان له الفضل في المساعدة على انجاز هذا البحث الأستاذة الفاضلة

((د. زينا))

المشرفة على البحث التي كان لها الفضل الكبير من خلال ملاحظاتها الدقيقة بشأن

فقرات البحث وإبداء الآراء الشافية لبعض الجوانب فيه ...

إلى من علمونا حرفا من ذهب وكلمات من درر وعبارات من أسمى وأحلى

العبارات .. **إلى أساتذتنا الكرام** الباحثتان

Abstract :

Industrial pollution is the contamination of the environment by businesses, particularly plants and factories, that dump waste products in to the air water. Industrial waste is one of the largest contributors to the global pollution problem endangering people and the environment many dangerous pollutants, by products of manufacturing, move in the air and water risking health and lives. common pollutants include carbon monoxide, formaldehyde, mercury and lead countries with high population density such as Iraq are facing many health problems caused by pollution resulting from population activities on different comports of the environment burden which the most dangerous these pollutants are the factories such as Al-Diwaniyah Textile factory, which are contaminated with dyeing and printing if not used within the permissible limit, central processing unit and through our study of the Diwaniyah textile factory. The dyeing and printing department was studied. All the dye and printing pollutants were studied. The chemical dyes used in this section, such as the effective dyes and pigments for printing. The most important structures in these dyes of chemicals such as caustic soda and is one of the effective dye materials and sodium sulfate, one of the dye and sulfur and methods mekanikitha materials and their structures of our study. As a conclusion, there no contamination due to the presence of the central control unit and treatment.

Chapter one

The theoretical part

Pollution industrial

Chapter two

Practical part

Al-Diwanyah textile factory section completion Department of central

Introduction

1.5 Introduction Industrial Pollution:

With the coming of the Industrial Revolution, humans were able to advance further into the 21st century. Technology developed rapidly, science became advanced and the manufacturing age came into view. With all of these came one more effect, industrial pollution. Earlier, industries were small factories that produced smoke as the main pollutant(1).

However, since the number of factories were limited and worked only a certain number of hours a day, the levels of pollution did not grow significantly. But when these factories became full scale industries and manufacturing units, the issue of industrial pollution started to take on more important(1).

Industrial pollution is generally referred to the undesirable outcome when factories or other industrial plants emits harmful by products and waste into the environment such as emissions to air or water bodies water pollution, deposition on landfills, etc. land pollution or emission of toxic chemicals into the atmosphere air pollution. This form of pollution has been improved and industrial revolution (2).

1.2 Causes of Industrial Pollution

1.2.1 Lack of Policies to Control Pollution Lack of effective policies and poor enforcement drive allowed many industries to avoid laws made by pollution control board which resulted in mass scale pollution that affected li ١ ıny people (3) .

1.2.2 Unplanned Industrial Growth: In most industrial townships, unplanned growth took place wherein those companies flouted rules and norms and polluted the environment with both air polluted the environment with both air and water pollution(4).

1.2.3 Use of outdated Technologies: Most industries still rely on old technologies to produce products that generate large amount of waste. To avoid high cost and expenditure, many companies still make use of traditional technologies to produce high and products(5).

1.2.4 Presence of Large Number of Small Scale Industries: Many small scale Industries: Many small scale industries and factories that don't have enough capital and rely on government grants to run

their day to day businesses often escape environment regulations and release large amount of toxic gases in the atmosphere(6).

1.2.5 Inefficient Waste Disposal Water pollution and soil pollution are often caused directly due to inefficiency in disposal of waste Long term exposure to polluted air and water causes chronic health problems, making the issue of industrial pollution into a severe one. It also lowers the air quality in surrounding areas, which causes many respiratory disorders (7).

1.2.6 Leaching of Resources From our Natural World: Industries do require Natural World: Industries do require large amount of raw material to make them into finished products. This requires extraction of minerals from beneath the earth. The extracted minerals can cause soil pollution when spilled on the earth. Leaks from vessels can cause oil spills that may prove harmful for Marin life (8).

1.3 Terrible Effects of Industrial Pollution

Industries and factories give off various pollutants into the environment including the land, air, and waters. It is estimated that about 50% of all pollution is as a result of industrial and manufacturing activities (2).

This effects as-:

1.3.1 Global warming

Global warming is among the most serious outcome of industrial pollution, witnessed on the account of the steady rise of industrial activities. Industries release into the atmosphere a variety of greenhouse

gases including carbon dioxide (CO_2) and methane (CH_4). These gases absorb thermal radiation from the sun thereby increasing the general temperature of the earth, leading to global warming. (2)

The cause of global warming is the increasing quantity of greenhouse gases in the atmosphere produced by human activities, like the burning of fossil fuels or deforestation. These activities produce large amounts of greenhouse gas emissions, which is causing global warming. Greenhouse gases trap heat in the Earth's atmosphere to keep the planet warm enough to sustain life, this process is called the greenhouse effect. It is a natural process and without these gases, the Earth would be too cold for humans, plants and other creatures to live.(9)

Greenhouse gas emissions, Greenhouse gases are produced both naturally and through human activities. Unfortunately, greenhouse gases generated by human activities are being added to the atmosphere at a much faster rate than any natural process can remove them (10).

To the Global warming there many effects from this effects: Global warming is damaging the Earth s climate as well as the physical environment. One of the most visible effects of global warming can be seen in the Arctic as glaciers, permafrost and sea ice are melting rapidly. Global warming is harming the environment in several ways including:(11)

1. Desertification
2. Increased melting of snow and ice.
3. Sea level rise.
4. Stronger hurricanes and cyclones.

1.3.2 Water Pollution

Pollutants discharged from the industries have widespread implications, and one of the unpleasant effects is on water bodies. Industries demand lots of water for efficient production such as cooling, cleaning, and treatment and as such, the water drawn from the water sources is never the same after use. Inappropriate contamination of used water and the discharge of different industrial waste water into water sources often result in water pollution (2).

The specific contaminants leading to pollution in water include a wide spectrum of chemicals, pathogens, and physical changes such as elevated temperature and discoloration. While many of the chemicals and substances that are regulated may be naturally occurring (calcium, sodium, iron, manganese, etc.) the concentration is often the key in determining what is a natural component of water and what is a contaminant. High concentrations of naturally occurring substances can have negative impacts on aquatic flora and fauna. (12)

Disease-causing microorganisms are referred to as pathogens. Although the vast majority of bacteria are either harmless or beneficial, a few pathogenic bacteria can cause disease. Coliform bacteria, which are not an actual cause of disease, are commonly used as a bacterial indicator of water pollution. Other microorganisms sometimes found in contaminated surface waters that have caused human health problems include:

1. *Burkholderia pseudomallei*
2. *Cryptosporidium parvum*
3. *Giardia lamblia*
4. *Salmonella*
5. *viruses other and Norovirus*
6. Parasitic worms including the Schistosoma type. (13)

Most water pollutants are eventually carried by the rivers into the oceans. (13)

Control of pollution: Decisions on the type and degree of treatment and control of wastes, and the disposal and use of adequately treated wastewater, must be based on a consideration all the technical factors of each drainage basin, in order to prevent any further contamination or harm to the environment. (12)

1.3.3 Air Pollution

Based on the increased counts of factories and manufacturing processes, both large and small scale, gaseous emissions have continued to compound. This makes industrial pollution one of the main causes of air pollution. The emissions from different industries contain gaseous contaminants such as sulfur, carbon dioxide (CO_2), oxides of nitrogen, methane, and so on. (2)

An air pollutant is a substance in the air that can have adverse effects on humans and the ecosystem. The substance can be solid particles, liquid droplets, or gases. A pollutant can be of natural origin or man-made. Pollutants are classified as primary or secondary. Primary pollutants are usually produced from a process, such as ash from a volcanic eruption. Other examples include carbon monoxide gas from motor vehicle exhaust, or the sulfur dioxide released from factories. (14)

Air pollution is a significant risk factor for a number of pollution-related diseases and health conditions including respiratory infections, heart disease, and COPD, stroke and lung cancer. The health effects caused by air pollution may include difficulty in breathing, wheezing, coughing, asthma and worsening of existing respiratory and cardiac conditions. These effects can result in increased medication use,

increased doctor or emergency room visits, more hospital admissions and premature death. (13)

1.1.2 Soil Pollution

Soil pollution occurs when the soil loses its fertility and structure owing to diverse natural and artificial phenomenon. Disposal of industrial wastes into landfills is among the artificial aspects contributing towards soil pollution. Industrial wastes have in them varied amounts of toxic materials and chemicals such that when deposited in landfills, it accumulates in the top soil thereby depreciating the fertility and biological activity of the soil due to soil poisoning.(2)

There many causes to Soil Pollution and it can be caused by the following:

1- Oil spill
2- Mining and activities by other heavy industries
3- Accidental spills as may happen during activates
4- Corrosion of underground storage tanks (including piping used to transmit the contents)
5- Acid rain (in turn caused by air pollution)
6- Intensive farming
7- Agrochemicals , such as pesticides herbicides and fertilizers.
8- Industrial accidents.
9- Road debris.
10- Drainage of contaminated surface water in to the soil.
11- Waste disposal.
    - Oil and fuel dumping
    - Nuclear wastes
    - Direct discharge of industrial wastes to the soil.
    - Discharge of sewage sludge
    - Landfill and illegal dumping
    - Coal ash

- Electronic waste
- Ammunitions and agents of war.

The most common chemicals involved are petroleum hydrocarbons, , solvents, pesticides lead and other heavy metals (16).

Contaminated or polluted soil directly affects human health through direct contact with soil or via inhalation of soil contaminants, which have vaporized; potentially greater threats are posed by the infiltration of soil contamination into groundwater aquifers used for human consumption, sometimes in areas apparently far removed from any apparent source of above ground contamination. This tends to result in the development of pollution-related diseases.

1.3.5 Effect on Human Health

The world Health Organization (WHO) revealed that outdoor air pollution accounts for about 2% of all lung and heart diseases. WHO also underscores, around 5% of all lung cancers and 1% of all chest infections are implications of outdoor air pollution.

In brief, these statistics indicate just how industrial air pollution depreciates human health.(2)

1.3.6Wildlife Extinction

The tendency of industrial and manufacturing processes that constantly demands production resources and repeated exploitation of raw materials has cumulatively led to the destruction of forests and the natural habitats that support wildlife.

Acts such as mining, deforestation, and utilization of water resources for industrial production have destroyed natural habitats and forced organisms to move further into the wild, exposing them to

predators and intolerable living conditions. Consequently, some wildlife species have faced extinction while several others remain highly threatened. Industrial wastes, chemicals, emissions, or accidental leaks, fires, oil spills and so on have also been prime contributors.(4)

1.3.7Other Common Implications

Other common implications of industrial pollution encompass damage to structures and buildings and increased risks of different occupational hazards like exposure to asbestos, chemical dust, among other mineral or metallic.(2)

1.4 Industrial waste

Which is defined as the waste produced by industrial activity which includes any material that is extracted useless during a manufacturing process such as that of factories, industries, mills, and mining operations. It has existed since the start of the Industrial Revolution.[1] Some examples of industrial wastes are chemical solvents, pigments, sludge, metals, ash, paints, sandpaper, paper products, industrial by-products, metals, and radioactive wastes.Toxic waste, chemical waste, industrial solid waste and municipal solid waste are designations of industrial wastes. Sewage treatment plants can treat some industrial wastes, i.e. those consisting of conventional pollutants such as biochemical oxygen demand (BOD). Industrial wastes containing toxic pollutants require specialized treatment systems. (23)

2.Different types of dyes with chemical structure

2.1 introduction about dyes

A dye is a coloured compound, normally used in solution, which is capable of being fixed to a fabric. The dye must be factor chemically stable so that the colour will not wash with soap and water, fade on exposure to sunlight etc. Dyeing is normally done in a special solution containing dyes and particular chemical material. After dyeing, dye molecules have uncut Chemical bond with fiber molecules. The temperature and time controlling are two key factors in dyeing. (18)

2.2 dyes

It is define, as the compound which containing chromophore and auxochrome groups called dye .Chromophore group is responsible for dye colour due to their saturations. Auxochrome group is responsible for dye fiber reaction.

2.3 Different types of dyes

Natural dyes are simply dye substances extracted from natural sources. Although the main source of dyes for early times, they have largely been replaced by synthetic dyes, which are usually more reliable, cheaper and can be supplied more readily. Natural dyes still in use

include haematoxylin, carmine, orcein. Colouring materials have been used for many thousands of years by man. Leather, cloth, food, pottery and housing have all been modified in this way. Some of our most common dyes are still derived from natural sources. These are termed natural dyes. The Colour Index uses this as a classification and naming system.

Each dye is named according to the pattern:

Natural + base colour + number

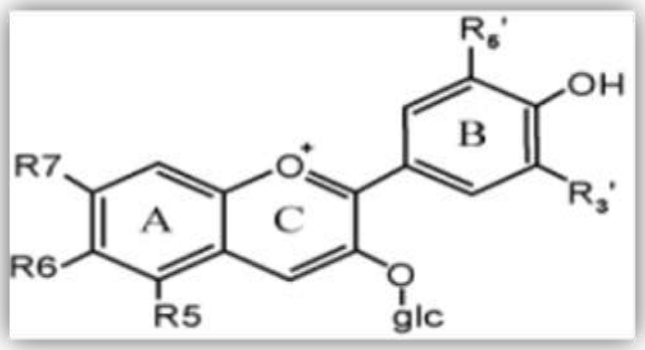

Figure 1: Natural dyes

Natural dyes are often negatively charged. While positively charged natural dyes do exist, but are not common. In other words, the coloured part of the molecule is usually the anion. Although the molecular charge is often shown on a specific atom in structural formula, it is the whole molecule that is charged. (20)

2.4 Synthetic dye

Dyes derived from organic or inorganic compound are known as synthetic dyes. Examples of this class of dyes are Direct, Acidic, Basic, Reactive, Mordant, Metal complex, Vat, Sculpture, Disperse dye etc. Synthetic dyes quickly replaced the traditional natural dyes.

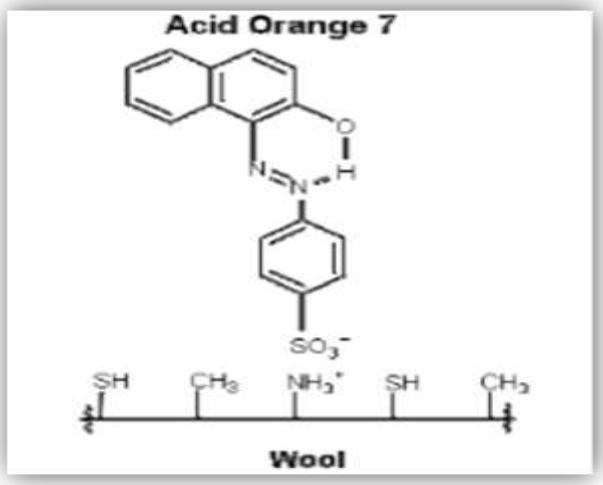

Figure 2: Synthetic dyes

They cost less, they offered a vast range of new colors, and they imparted better properties to the dyed materials dyes are now classified according to how they are used in the dyeing process.

2.5 properties of dyes

- These dyes are economical dyes and are generally used to produce dark shades such as dark greens, dark blues and blacks.
- These dyes have good leveling and color fastness properties.
- The interaction between fiber and dye is established through very strong ionic bonds, which are formed between the anionic groups of the colorant and ammonium cations on the fiber. Chromium or the metal ion acts as bridge between the dye and fiber , which gives rise

to a very strong linkage , resulting into excellent fastness properties.(19)

There are many many types of Dyes :

2.6.1 Reactive dyes

Reactive dyes famous in chemical reaction color brightness and good colour fastness in washing and lighting in the boiling point. Since 1956 the bigger company began to product this dyes. Every reactive dyes molecules have one or More tomes chlorine let it reacted with hydroxide group of the cellulose.

2.6.2 Method of dying Reactive dyes

1) Pad-batch method

a. Pad (alkali)-batch (cold) process.

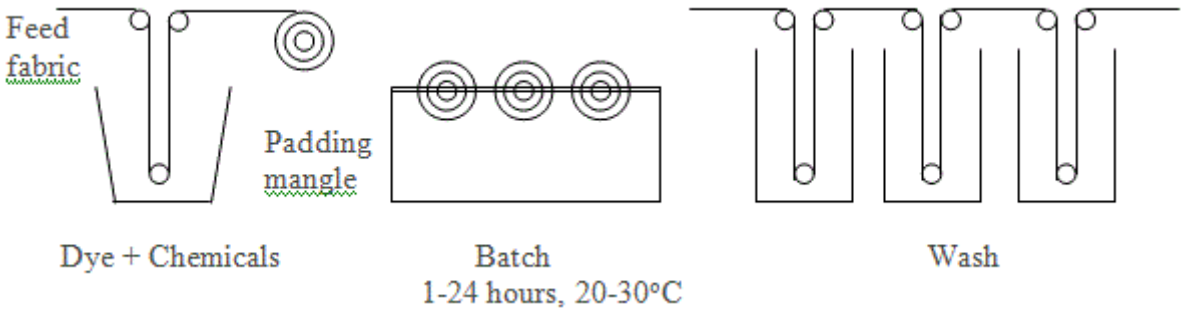

Figure 3: Pad-batch method

Steps:

1. The fabric is first padded in a padding mangle with reactive dye in presence of an alkali.
2. The padded fabric is rolled in a batch and the batches are wrapped by polyethylene sheets and stored in wet condition for 1-24 hours at 200-300℃ in a room.

3. During the storage period, the rolls may be kept slowly rotating to prevent seepage of the dye liquor.
4. After storing time is finished fabric is washed in a rope washing machine to remove the unfixed dye from fabric surface.

b. Pad batch (hot) process:

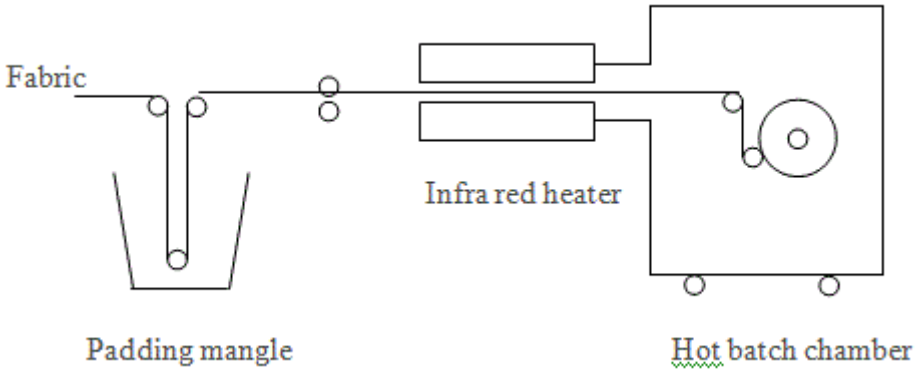

Figure 4: Pad batch (hot) process

Steps:

1. The fabric is first padded in a padding mangle with reactive dye in presence of an alkali.
2. The fabric is then passed in between infrared heater to preheat the padded fabric to 500C to 900C.
3. The fabric is then batched on a large diameter roller in a hot chamber. The batching is done under controlled conditions of temperature and humidity for a sufficient time to ensure diffusion and fixation of the dye in the fibre. During this period the batch is kept slowly rotating to avoid the seepage of dye liquor.
4. The cloth is then washed in a rope washing machine to remove the unfixed dyes.

2) Pad dry method:

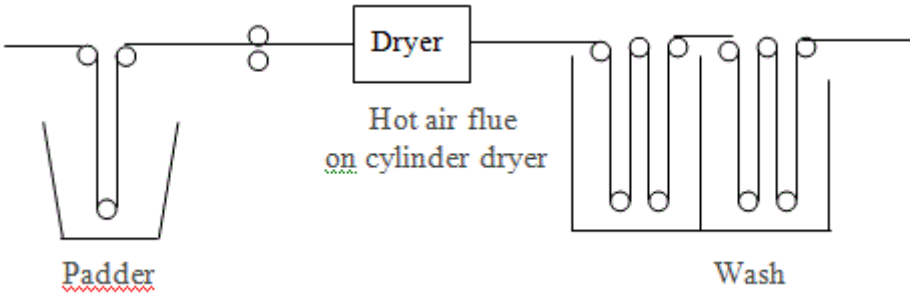

Figure5: Pad dry method

Steps:

1. Fabric is first padded in a padder with reactive dye in presence of an alkali.
2. Padded fabric is then passed through a squeezing roller into a dryer. As a dryer cylinder, stenter etc may be used. During drying due to higher temperature fixation of dye in fibre increases and at the same time water is removed by evaporation.
3. After drying fabric is washed in a washing machine to remove unfixed dye.

3) Pad steam method:

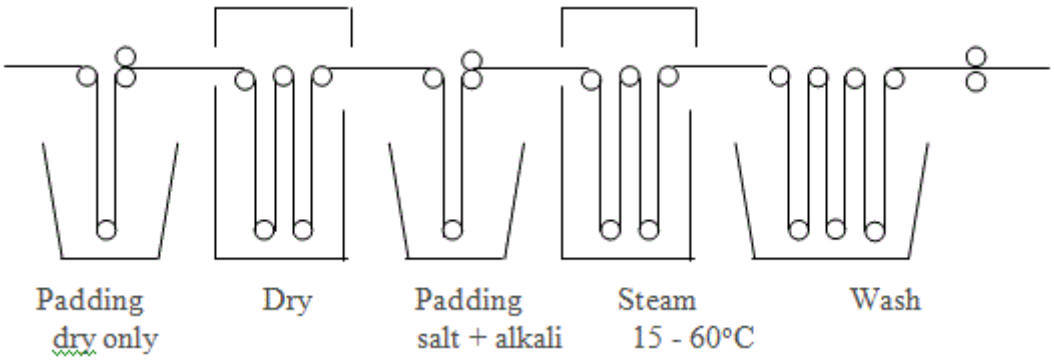

Figure 6: Pad steam method

Steps:

1. Fabric is first padded in a padder with the dye.
2. It is then passed through between two squeezing roller in a dryer. Drying should be done slowly; otherwise precipitation of dye due to quick removal of water may take place leading to lower color value.

3. After coming out from dryer fabric is padded in a padder containing salt and alkali. Due to salt exhaustion of dye takes place and due to alkali fixation occurs.
4. Fabric then passed through a steamer where it is kept for 15-19 second. Due to high temperature here fixation rate increases.
5. In this step fabric is washed in a washing machine to remove the unfixed dye.

2.6.3 Temperature needed in the reactive dying:

1. cold dying
2. 50℃ dying
3. 80℃ dying

2.6.4 Chemical used in dying:

1. Caustic soda ,(NaoH) (KEMITEKS)
2. Sodium Carbonate (Na_2CO_3) (KEMITEKS)
3. Sodium Bicarbonate ($NaHCO_3$) (KEMITEKS)
4. Gluber salts (Na_2SO_4) EINECS 9-8200-231) (KEMITEKS)
5. Urea. (KEMITEKS)
6. Wetting agent (Moisturizing material traduce the tension of surface tension. (KEMITEKS)

2.6.5 Machines used in the reactive dying:

1. Pad – dry machine
2. Pad – steam continues machine
3. Pad Cl – RO_2 Machine
4. Tigger machine
5. Beam dying machine

2.6.6 Fixing temperature of reactive

1. 105˚C in saturated steam
2. 105℃ in thermosal method

2.6.7 Washing of reactive dying:

1- Washing cold water

2- Washing in hot water

3- Washing in cold water

4- Washing in hot water

5- soaping with soap and soda ashe

6- washing with cold water

Reactive dyes are extensively used for coloration of cellulosic fibers because of their excellent wash fastness (stability to washing with aqueous detergent solutions), which arises from covalent bond formation between dye and fiber. However, up to 40% of the dyestuff may hydrolyze in the dyeing process; this hydrolyzed dye has affinity for the fiber via hydrogen bonding and van der Waals interactions, but is not covalently bonded and as such exhibits poor wash fastness.

2.6.8 This type is the Reactive Blue 5 dye shown below.(21)

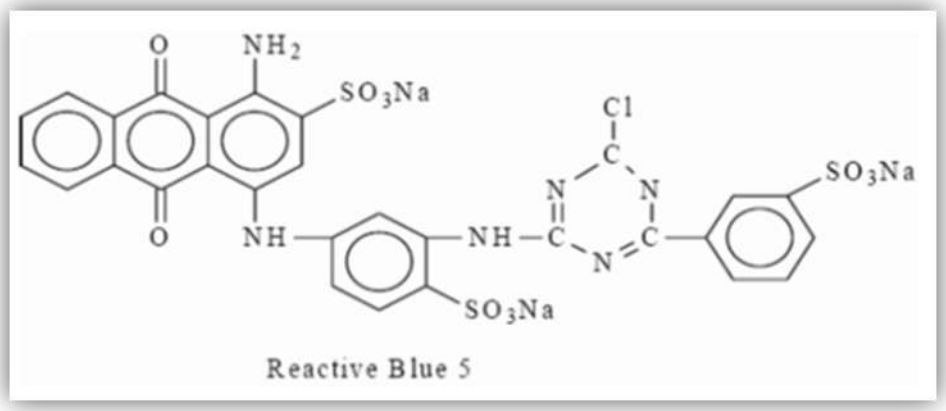

Figure 7: Reactive Blue 5 dyes

2.7 Sulphur Dye :

Sulphur Dyes have good fastness against the light and medium wash fastness and weak chloride in fastness usually Sulphur. Dyes used in leavyclothes with dark color.

Sulphur Dyes dissolved in water because they have not any soluble group for this dyes changed to soluble form in oxidization with sodium. Sulphur Dyes a long time and must be keep in cold store.

Sulphur Dyes usually used in dying black clothes because it is not blighting dyes.

2.7.1 Method of dying:

1- pad –steam dying
2- Jigger
3- Beam dying
4- Jet dying

2.7.2 Chemical used in dyeing

1- Sodium carbonate (Na_2CO_3) (KEMITEKS)
2- Sodium solphite (Na_2SO_4) (KEMITEKS)
3- Gluber soil (Na_2SO_4) (KEMITEKS)
4- Welting agent. (Moisturizing material traduce the tension of surface tension). (KEMITEKS)

2.7.3

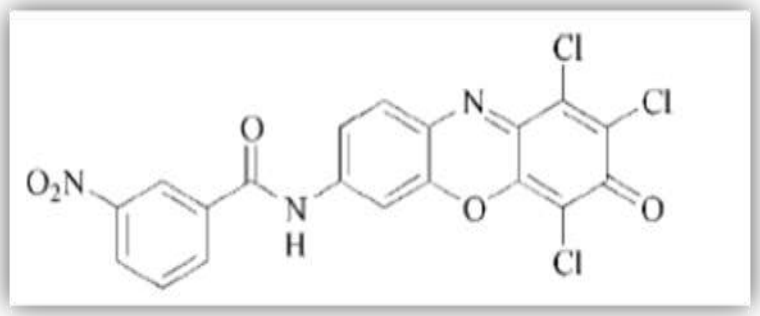

Figure 7: Sulphur Dyes

2.8 Printing on the tissue (pigment)

Pigments are mainly synthetic organic materials. Pigment printing is producing attractive design by applying pigment paste on the fabric surface. Pigments are found in particle state and the particle size range should be in the region of 0.1 – 3 microns. Pigment printing is done with binder system. The pigment has no ability to bind to cotton fabric for this reason binder is required during printing. The binder is a film forming substance made up of long macromolecules which when applied to the textile materials together with the pigment, produce a 3- dimensional networked. The 3-dimensional links are formed during some suitable fixing process, which usually consist of dry heat and change in pH value (<5), bringing about self-cross linking or reaction with suitable cross-linking agent. This cross-linking improves the elasticity and adhesion of the film to the substrate. Pigment printing has lots of advantages and disadvantages. Following is the advantages and disadvantages of pigment printing.(22)

2.8.1 Advantages of Pigment Printing

2.8.1.1 Pigment can be applied for a natural as well as for a synthetic fibers.

2.8.1.2 Pigment print is an easy task for the printer.

2.8.1.3 Pigment printing is most economical printing process.

2.8.1.5 Pigment printing allows maximum output of goods.

2.8.1.6 Fastness properties are good to average.

2.8.1.7 Well defined design can be produced by pigment printing.

2.8.2 Disadvantages of Pigment Printing

2.8.2.1. Pigment printed textile wears are not comfortable to wear.

2.8.2.2. Pigments are suitable to crushing during roller printing.

2.8.2.3. Rubbing is medium.

2.8.2.4. Pigments are completely fast to dry cleaning. (22)

2.9 Pigment dyes Printing:

High covering power sates factory fastness properties aqueous dispersion of titanium dioxide with acrylics binder and use cotton, manmade fiber composited as.

2.9.1 Pigmapol PF : synthetic thickener for pigment printing

2.9.2 Kemipnnl ALD : low viscosity sodium alginate

2.9.3 Binder SF: High chemical and mechanical stability with good run ability provides excellent fastness properties with soft handle and good colour value. (21)

2.9.4

- devices: Blender fimat s.r.l costruztioni miccaniche via leonrdavinci ,6.Gironico ,Italy .

- Balance : fimat s.r.l costruztion maccaniche via leonrdavinci, 6.Gironico,Italy .

- Candidatedevie : costruzationi machine pertintostamperie –G-Gombo 22020GlRowico,italy.

- mixing vessel

Figure 8: Pigment dyes Printing unit

2.9.5 Materials :

- Pigm A color
- Pigm A pol pen
-Batchon : 1504001
- KEMITEKS

- PigmA color
- Fixator F.F
- Batch no : 1503364
- KEMITEKS

- PigmA color
- PigmA Fix DSF
- Batch no : 1503364
- KEMITEKS

- PigmA color
- G.YELLOWKF
- Batch no : 1604292
- KEMITEKS

-Vear KEMITEKS
- PigmA color
- BINDERSF
- Batch no : 1602287
- KEMITEKS

- PigmA color
- PIGMA POL F.X
- Batch no : 1501184
- KEMITEKS

Figure 9: Types of Pigment dyes in Printing unit

PROCEDURE :

2.9.6

1. In the mixing vessel, 62.5L.from normal water was add.
2. 25kg from Binder(SF) was add to the water.
3. 1.5kg pigma fix (bsf) was added to the mixture.
4. 2kg pigma pol ST was added to the mixture.
5. 2kg fixator (FF) was added to the mixture.
6. 1.8kg pigma pol (PEN) was added to the mixture.
7. 0-4kg pigma pol (FX) was added to the mixture.
8. 4kg urea was added to the mixture.

a

b

c

d

Figure 10 : Steps of printing process in Printing unit

9 . All this materials mix together by blender drags in mix about half hours after take mix into can dilute device for purpose pure form inclusions after dought ready to put on tissue for purpose printing by machine printing tissue in clear shape.

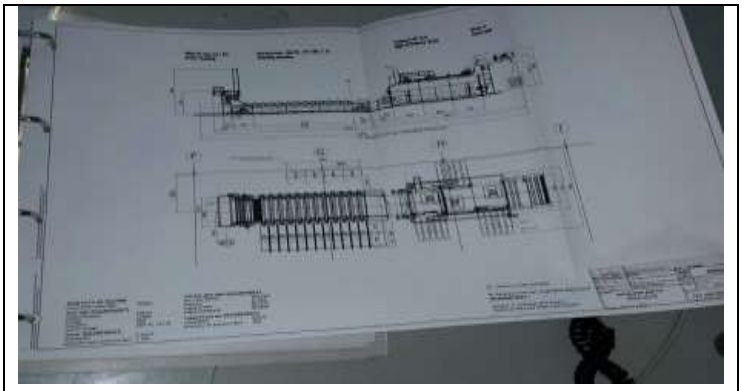

Figure 11 : Printing machine

3. Department of central processing unit

3.1 Al-Diwanyah-Textille factory

Unit treatment central : After process printing and dyeing some would be waste if not used enclose limiting ideal .

3.2 Industrial water shall be installed the assembly channel through pipes extending in all parts of the plant for pulling solid materials from them.

3.3 After pulling the solid materials out of the industrial water, the water is pumped from the assembly channel by pumps to a basin called the basin where the oil and oil float to the top living the water.

3.4 The water is pumped by pumps from sink the equation basin where HCL and NaOH are added for ph , ph = 7 .

3.5 The water is then pumped from the basin of the equation by pumps to the settling basin where alum $Al_2(SO_4)_3$ is added to purify the water of impurities.

3.6 The water is pumped by pumps from the sedimentation basin to the ventilator basin. In addition there is the addition of the fixed molasses for the purpose of activating the Bactria and the generation of the oxygen (O_2) gas in order to break up the waste materials that have been left.

3.7 The water is pumped by pumps from the ventilator basin to the pond for the purpose of additional deposition, after which the water is released but is contaminated.

3.8 The water is the pumped by the pumps to the final tricide basin where sodium hypochlorite is added for purifying and killing bacteria.

3.9 After this process, the water is discharged pure to the spindle and not harmful to the living organisms and the environment.




Figure 12 : Pumping and discharching the water by pumps

4. Suggestion

a) Minimize the treatment of pollutants with chemicals and find alternative methods.

b) Factories are considered the most important pollutants in the environment because of their negative impact on all components of the environment.

c) Reduce the use of water in the cooling machines where it is one of the main causes of pollution.

d) Reduce the use of oil machine boilers used for the manufacture, dying and printing of textiles or using alternative methods to avoid air pollution resulting from the release of machine steam in to the air.

e) Its necessary to maintain and ensure the use of chemical dyes , whether for printing or dying with in the permissible or ideal limit of possible of the severe damage to the environment because of the condiment of many chemicals harmful to living organisms and the causes of disease of the members of society , particularly sever stativity and skin cancer , on the treatment of industrial water resulting from the possess of dyeing and printing before being put in to lakes or rivers to avoid the suffocation and death to organisms living in this medium.

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