



Effect Of Carbon Di Sulphide On Adults

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Abstract

Carbon disulfide is a colorless volatile liquid with the formula CS_2 . The compound is used frequently as a building block in organic chemistry as well as an industrial and chemical non-polar solvent it is widely used in the synthesis of organosulfur compounds such as metham sodium, a soil fumigant and is commonly used in the production of the soft fabric viscose. At high levels, carbon disulfide may be life-threatening because it affects the nervous system. Significant safety data comes from the viscose rayon industry, where both carbon disulfide as well as small amounts of H_2S may be present. Probable routes of human exposure to carbon disulfide are inhalation, ingestion, and skin contact. Any substances you breathe in can become an allergen. Industrial fumes (especially those containing sulphur, household chemicals.

In present work effect of carbon-di-sulphide on the health on adults of Nagda town with special reference to asthma was studied.

Key words: Carbon disulfide, Adults, Asthma

1- INTRODUCTION

Carbon disulfide is a colorless volatile liquid with the formula CS_2 . The compound is used frequently as a building block in organic chemistry as well as an industrial and chemical non-polar solvent. It has an "ether-like" odor, but commercial samples are typically contaminated with foul-smelling impurities, such as carbonyl sulfide. Compared to CO_2 , CS_2 is more reactive toward nucleophiles and more easily reduced. These differences in reactivity can be attributed to the weaker π donor-ability of the sulfido centers, which renders the carbon more electrophilic. It is widely used in the synthesis of organosulfur compounds and is commonly used in the production of the soft fabric viscose.

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H_2S may be present. Carbon disulfide breaks down into other chemical substances after it enters the body. Medical tests can measure levels of these substances in urine and blood, but the tests are not reliable indicators of total exposure.

Acute effects: At very high levels, carbon disulfide may be life-threatening because of its effects on the nervous system or heart. Exposure can be through inhalation, absorption through the skin, ingestion, or skin or eye contact. In acute poisoning, early excitation of the central nervous system resembling alcoholic intoxication occurs, followed by depression, stupor, restlessness, unconsciousness, and possible death. If recovery occurs, narcosis, nausea, vomiting, and headache can occur.

Chronic effects: In chronic poisoning, there are sensory changes such as a crawling sensation in the skin, sensations of heaviness and coldness, and "veiling" of objects so that they appear indistinct. Exposure can cause

changes in breathing, chest pains, muscle pain, weakness, loss of feeling in the hands or feet, eye problems, skin blisters, chronic fatigue, loss of memory, personality changes, irritability, dizziness, anorexia, weight loss, psychosis, polyneuropathy, gastritis, kidney and liver damage, dermatitis, mental deterioration, Parkinsonian paralysis, and insanity. Carbon disulfide may damage the developing foetus. It may decrease fertility in men and women, causing sperm abnormalities and spontaneous abortions.

Entering the body

Probable routes of human exposure to carbon disulfide are inhalation, ingestion, and skin contact.

Acute (short-term) ecological effects:

Acute toxic effects may include the death of animals, birds, or fish, and death or low growth rate in plants. Acute effects are seen two to four days after animals or plants are exposed to a toxic chemical substance. Carbon disulfide has moderate acute toxicity to aquatic life. No data are available on the short-term effects of carbon disulfide to plants, birds, or land animals.

Chronic (long-term) ecological effects:

Chronic toxic effects may include shortened lifespan, reproductive problems, lower fertility, and changes in appearance or behavior. Chronic effects can be seen long after first exposure to a toxic chemical. Carbon disulfide has high chronic toxicity to aquatic life. No data are available on the long-term effects of carbon disulfide to plants, birds, or land animals.

Entering the environment

Carbon disulfide evaporates rapidly when released to the environment. Carbon disulfide does not stay dissolved in water very long, and it also moves quickly through soils.

Carbon disulfide reacts with the hydroxyl (OH) radical in the atmosphere, with the effective rate constant depending on O₂ concentration and total pressure. Based on the literature rate constant at one atmosphere

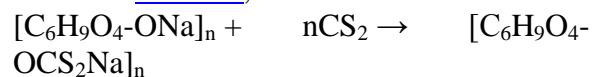
of air, the calculated half-life of carbon disulfide due to its reaction with the OH radical are about 8 days. Its reaction products include carbonyl sulfide and sulfur dioxide

Carbon disulfide is non-persistent in water, with a half-life of less than 2 days. About 99.8% of carbon disulfide will eventually end up in air; the rest will end up in the water.

Nagda is a city in Ujjain district in the Indian state of Madhya Pradesh. It is an industrial town in the Malwa region of western Madhya Pradesh and is situated on the bank of Chambal River.

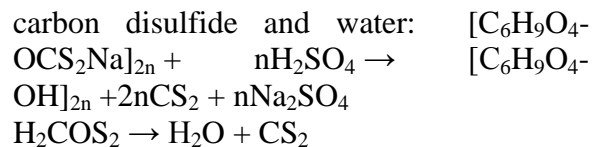
Nagda is a major industrial town having manufacturing unit of Viscose fiber, thermal power plant and a chemical plant,

Viscose is a solution of cellulose xanthate¹²⁻²² made by treating a cellulose compound with sodium hydroxide and carbon disulfide. Byproducts include sodium thiocarbonate, sodium carbonate, and sodium sulfide. The viscose solution is used to spin the fiber viscose rayon, or rayon, a soft man-made fiber commonly used in dresses, linings, shirts, shorts, coats, jackets, and other outer wear. It is also used in industrial yarns (tyre cord), upholstery and carpe. Viscose rayon is a fiber made from regenerated wood cellulose. Viscose rayon is structurally similar to cotton, which is almost pure cellulose. Cellulose is a linear polymer of β-D-glucose units with the empirical formula of (C₆H₁₀O₅)_n. which has the approximate formula [C₆H₉O₄-ONa]_n. The alkali cellulose is then treated with carbon To prepare viscose, the cellulose is treated with sodium hydroxide to form "alkali cellulose," disulfide to form a solution of sodium cellulose [xanthate](#), which is called viscose.

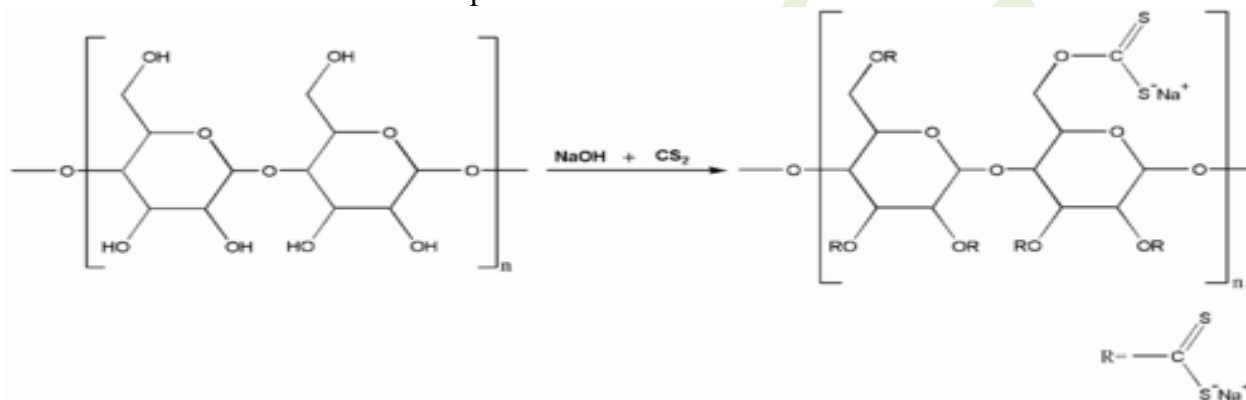


The higher the ratio of cellulose to combined sulfur, the lower the solubility of the cellulose xanthate. The xanthate is dissolved in additional sodium hydroxide and allowed to depolymerize to a desired

extent, indicated by the solution's viscosity. The rate of depolymerization (ripening or maturing) depends on temperature and is affected by the presence of various inorganic and organic additives, such as metal oxides and hydroxides. Air also affects the ripening process since oxygen causes depolymerization. Rayon fiber is produced from the ripened solutions by treatment with a mineral acid, such as sulfuric acid. In this step, the xanthate groups are hydrolyzed to regenerate cellulose and release dithiocarbonic acid that later decomposes to



Aside from regenerated cellulose, acidification gives hydrogen sulfide, sulfur, and carbon disulfide. The thread made from the regenerated cellulose is washed to remove residual acid. The sulfur is then removed by the addition of sodium sulfide solution and impurities are oxidized by bleaching with sodium hypochlorite solution.



Cellulose is treated with alkali and carbon disulfide to yield viscose. Reaction of cellulose with carbon disulfide and base gives "viscose", a soluble polymer that can be converted into Rayon.

2- ASTHMA

Asthma is characterized by recurrent episodes of wheezing, shortness of breath, chest tightness, and coughing. Sputum may be produced from the lung by coughing but is often hard to bring up. During recovery from an attack it may appear pus like due to high levels of white blood cells called eosinophils. Symptoms are usually worse at night and in the early morning or in response to exercise or cold air.²¹ Some people with asthma rarely experience symptoms, usually in response to triggers, whereas others may have marked and persistent symptoms.²²

A number of other health conditions occur more frequently in those with asthma, including gastro-esophageal reflux disease (GERD), rhino sinusitis, and obstructive

sleep apnea.^[21] Psychological disorders are also more common with anxiety disorders occurring in between 16–52% and mood disorders in 14–41%. [However, it is not known if asthma causes psychological problems or if psychological problems lead to asthma.²³

Asthma is caused by a combination of complex and incompletely²⁴ understood environmental and genetic interactions. These factors influence both its severity and its responsiveness to treatment. It is believed that the recent increased rates of asthma are due to changing epigenetic (heritable factors other than those related to the DNA sequence) and a changing living environment. Many environmental factors have been associated with asthma's development and exacerbation including allergens, air pollution, and other environmental chemicals. Smoking during pregnancy and after delivery is associated with a greater risk of asthma-like symptoms. Low air quality from factors such as traffic

pollution or high ozone levels has been associated with both asthma development and increased asthma severity. Exposure to indoor volatile organic compounds may be a trigger for asthma; formaldehyde exposure, for example, has a positive association. Also, phthalates in PVC are associated with asthma in children and adults. Asthma is associated with exposure to indoor allergens. Common indoor allergens include: dust mites, cockroaches, animal dander, and mold. Efforts to decrease dust mites have been found to be ineffective. Certain viral

respiratory infections, such as respiratory syncytial virus and rhinovirus, may increase the risk of developing asthma when acquired as young children. Certain other infections,.

3- METHODOLOGY

In present work the effect of carbon di sulphide on adults with reference to asthma was studied. The observations were done in five steps. Three reputed hospitals were visited frequently. The average no of patients were calculated from the records randomly.

MONTH	AVERAGE PATIENTS IN A DAY IN EVENING SHIFT TO DIFFERENT HOSPITAL OF NAGDA					
	DR. A.		DR. B		DR. C	
	TOTAL	ASTHMA	TOTAL	ASTHMA	TOTAL	ASTHMA
Jan-13	29	6	25	5	28	7
Feb-13	25	5	22	4	22	6
Mar-13	20	5	23	5	18	4
Apr-13	23	3	19	2	20	1
May-13	18	2	16	1	15	1
Jun-13	17	2	19	1	14	2
Jul-13	20	3	21	4	21	3
Aug-13	21	4	23	5	20	7
Sep-13	17	3	19	2	16	3
Oct-13	15	1	18	1	19	2
Nov-13	18	1	17	1	15	1
Dec-13	21	6	26	5	27	6
Jan-14	25	7	29	8	30	9

4- RESULTS AND DISCUSSION

After monitoring and tabulating it was found that After monitoring and tabulating it was found that April to June 2013 =9%, in July to September 2013 = 18% October to November 2013=6% and in December 2013 to January 2014 =25% patients were found.

The weather remains dry in April, May and June and October and November are known fair season during those days the % of asthma patients less recorded. Due to the westerlies, the overall wind direction is from the west. The predominant direction is from the northwest in the winter and southwest in the summer. Less % of asthma patients in

October and November is due to the direction of wind which keeps away the gases from the residential places. When the direction of wind changes or during monsoon or humid season ratio of patients increases.

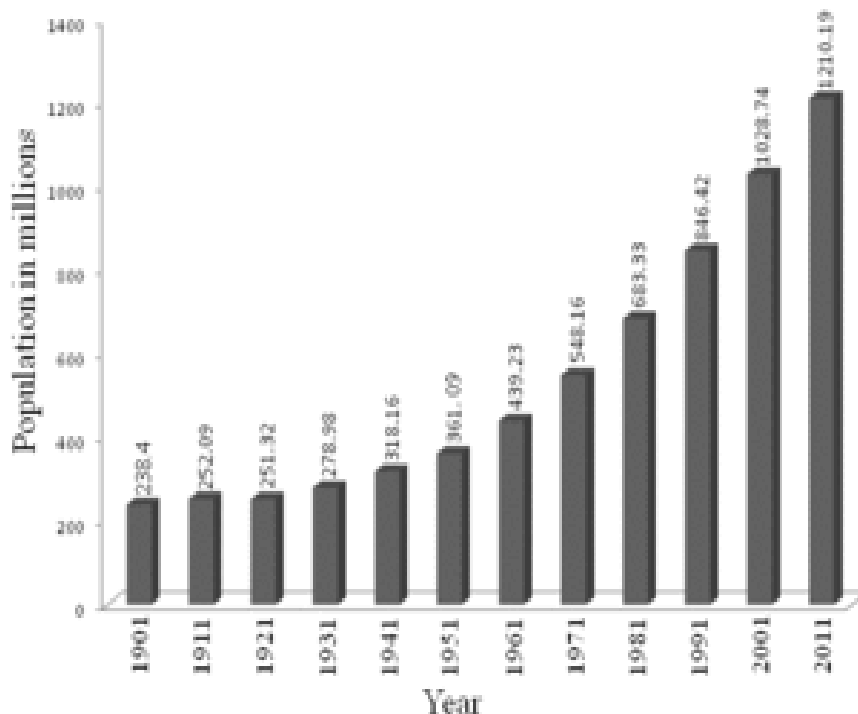
5- CONCLUSION

Our country is developing nowadays Industries are the major part of development. Increases in population jobs are also needed. Industries are providing the jobs but some environmental issues are there. In present study the effect of carbon di sulphide on adults were studied and it was compared to the one hospital of Bhopal and

it seems that the % of patients were less in non polluted area. Three factors are there 1-

pollution 2- Weather 3- Life style.

6- RECOMMENDATIONS



Census report

- The residential area must be away from the polluted area.
- Town and country planning must be rigid.
- There must be awareness regarding health and hygiene.
- Awareness to population growth.
- Slum area of town must be monitored
- Last but not least basic science education is needed for each and every person.

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