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AIR-INK:THEWORLD'SFIRSTINKMADEOUTFROMAIRPOLLUTION.

MR.PIYUSHKUMARVASUDEVBHAIUPADHYAY

Chemistrydepartment

ShriR.P.Arts,K.B.CommerceandSmt.B.C.J.SciencecollegeKhambhat,Gujarat,India.

Abstract:-

To transfer the microscopic particulate matter (known as PM 2.5) in machinery exhaustresultingfromburningfossilfuels-whatwemightcallsoot–intoblackink.Whetherfromcars and trucks or generators and factories , what have been inhaled by millions orcontaminated water and soil, can now be used for drawing and printing, carbon black, aby product of petroleum products, is normally used to produce ink ,as well as be acomponent in rubber, paints and plastics. Rather than burn new fossil fuels for inkproduction.

The black ink we use in our pens or in inkjet printers is essentially made from soot. Thetechnicaltermforthesubstanceis"carbonblack",anditisthepowderthatremainsafterburning coal or oil. The powder is mixed with a polymer and a solvent to turn it intosmooth, flowering black roller ball ink. " so if you can do it with soots, can we do thesame with air pollution?" The answer is that " The black colour in the pen you use ismade by burning fossil fuels to make ink. But you should not need to burn new fossilfuelsjusttomakeink.Fossilfuelsarealreadybeingburned."

Keywords:-

Air-Ink, Awareness, Carbon capture, Emissions, Environment, Fossil fuels, Industries,Markets,Negative,Pen,Pigments,pollutants,Pollution,Positive,Recycled.

Introduction:-

Air–Inkisaproprietarybrandofinkandcompositesproductsmadebycondensingcarbon–based gaseous effluents generated by air pollution due to incomplete combustion offossilfuels.Air-Inkproducesit'smaterialsthroughastepbystepprocesswhichprimarilyinvolves capturing of emissions, separations of carbon from emissions, and then mixingof this carbon with different types of oils and solution to achieve advanced materialsproperties,ItusesapatenteddeviceandtechniquecalledKAALINK"tocarryoutofthefiltration of soot, which contains carbon and other polluting agents like heavy metals andpolycyclearomatichydrocarbon.Air-Inkismarketedasasolutiontoairpollutionanditsnegativeeffectsonhumanlife,byallowingtheprintindustrytooffsetitscarbon.Dubbedas"Thefirstinkmadeoutofrecycledair pollution",itsproductswereusedinJune2016,in association with Heineken to create street art and murals in Hong Kong'sSheung Wandistrict.30-50minutes ofcarpollutioncansupplyenoughcarbontofilloutAir-Inkpen.

Sootcomposedof2-5micrometerblackscarbonparticlesfoundinpetrolordieselcarbonemissions is captured from the tailpipes of cars and diesel generators through a devicecalled“KAALINK”.

Aseparate ensuresthatcarbonparticulateis recycledintosafe inkswithoutheavymetals /toxins.

A single Air-Ink pen contains 30-50 minutes of air pollution. The emissions from 2500hoursofdrivingonestandarddieselvehiclesproducesabout150litresofink.Researcherse xplain there are seven different grades of Air-Ink, with different applications: Fabric,Outdoor paints, etc. Researchers process the captured pollution to remove the heavymetalsand carcinogens buttheinksusedforart work/graffitietcare notfitfor inhalation /ingestion. This is similar for any other ink or paint. At the present time, Air –Inks andpaints are being produced in different shades of grey and pitch black, and separate effortis being made to brogden by adding more varieties of inks and paints. Once researchersadd printers cartridges refills to their portfolio, they shall be able to reduce the carbon –footprints in businesses/offices too. Researchers were confident on the commercialviability of their products and looking forward to commercial launch by the end of thisyear. The Air-Ink is not only reducing pollution, but it is also being used as a politicalcampaign to increase awareness about the seriousness of pollution. In just 45 minutes ofcollectionfromanexhaustpipe,onewholepencanbefilled.Thisreallyputsinperspective just how much pollutants is released into the air in a short period of time. Inaddition to perspective, the start up is creating murals using its own ink, adding to streetartandinturntoculture.

Methodsandmaterials:-

Researchers, the first commercial ink made entirely from air pollution. It started as asmall proof of concept experiment using soot from air pollution to make paints, when itworked, team built a laboratory in a small garage in Bangalore to create a device thatcould capture air pollution at the source, in engines or factory machinery. In the sixmonths they spent in India refining their technology. It was not hard to find pollutionsources for experimenting. Researchers explain that in western countries, like the UnitedStates, stricter regulations already require companies to dispose of carbon particulatesresponsibility. However, in places like India where regulations are more relaxed, wastebuilds up quickly at small to medium-size businesses because it can beexpensive todispose without systems in place to get rid of the waste, plenty will end up in landfills orevenrivers.Teamputacallouttoareafactoriesaskingfortheircarbonparticulate,anditwasnot onlylongbeforepollutersstartedcontainighimtocollecttheirwaste.

Team developed a filtering device called “KAALINK” derived from the Hindi word“KAALA” meaning black, that was comprised of a steel cylinder that could be affixed toan exhaust. Now, kaalink can be scaled up to filter air pollution from just about anysource, like a smokestack on small machinery or even straight out of the air, and turn itinto soot, which is then hydrated to form ink that can be used inAir-Ink pens andmarkers.Each markerholds about30 millilitresofAir-Ink,which isequivalent toapproximately 45 minutes of diesel car pollution. The researchers realized that Air-Inkpens produced high-quality, long-lasting, deeply-pigmented non-toxic pigment usingrecycledmaterial,workspreadfast.Air-Inkwillbedisplayedinthe“salvage”section.

Artist Ellen Lupton, a senior curator at Cooper Hewitt, used Air-Ink markers to stencilpart of the exhibition's message on reclaimed wood and other recycled material. She wassurprisedbythematerials"superqualities"asanartproducts,nothingthattheinkissuperblack, withstands prolonged use, holds up on "variety of surfaces and mediums, andwould not been through paper or dry out quickly. " I was surprised at how functional theproduct is, it is an incredible nation that you can turn pollution into ink. I did not think itwould be so fun to use. She says and makes you think if these particles are in the air andtheyarethatpigmented,itischilling.

As for researcher and Air-Ink, the focus is expansion to an industrial scale. The inventorwould like Air-Ink to be used in practical applications, newsprint, textbooks, or textilesprinting in the fashion industries. Researchers set up industries for their comfort, but theenvironment has to bear the price of it. Researchers explains, adding that Air-Ink is notsilver bullet solution to the world's pollution problem. "It is a start, and it can inspireseveralotherstostartlookingatnewformsofwastethatarelyingoutsideunutilized.

Resultsanddiscussions:-

Air-Ink is a project born with a clear purpose : To fight against the evident fact of airpollution and contribute to a better environment, free of toxic waste. Air pollution, it is areality that we are facing from some years back, Humankind has gone too far abusing ofmassivemechanismsthathasproducedlargeamountsoftoxicpollutantsandhasbecomethe single largest environmental and human health threat in the entire human's history.The engineer and developer of the project, experienced in first-hand the effects of airpollution, while he was walking in Mumbai in 2013 and his clothes got stained black dueto the amounts of pollution in India's air. It was after that trip when came up with thiscreativeandnewideaofturningairpollutionintoink.GravikyLabsisanaward-winningclean technology company that has industrialized the process of recycling air pollutionemissions into advanced pigments and inks. Graviky Labs current focus is to reinterpretthe environment conversation through fusion of science, art and develop technologieswhichhavenet–positiveimpactonourenvironment.

Airpollutionfactandfigure

- 1700deaths
  Schoolsinapproximatelyofunsafeairquality.
- 1.4millionsprematuredeathsayearinIndialinkedwithairpollution.
- 11millionsdieselcars/generatorsworldwidedesignedtocheatairpollutiontests
- 8.3%percentGDPwhatairpollutioncostsIndia'seconomy.

Cleaningup ourairwill alsohelpinthefightagainstclimate change,thebiggestenvironmental problem we face. Currently the company is ona 'kickstarter' campaign,which is a crowd-sourced operationthat allows people to pledge a certain amount ofmoneytosupportinnovativeservicesorproducts."peoplefromalloverconstantlyaskushowtheycangettheirhandsonAir-Inkanduseitintheireverydaylives.Butatthistimeourpollutioncaptureprocessisverylabourintensiveandcanonlyhappenonaverysmall50scale.Thiscampaignwillallowsustoscaleupandmake Air-Inkmorewidely

accessible,"the company said.Having fieldforpatents,itplanstoexpand beyondautomobiles into collection of soot from different sources of pollution such as chimneysand generators. The company claims that it has so far captured 1.6 billion micrograms ofparticulateswhichequates"cleaning"1.6trillionlitresofoutdoorair.EachpencontainstheAi r-Inkcapturesapproximately40-50minutesofairpollution/Pmgeneratedbycar.

Conclusion:-

After discoveringawaytocapturepollution,GravikyLab'shasbeganrepurposingitintoan ink called Air-Ink. The benefits of this medium is reduced air pollution, recycling, thecarbonforprinting,painting,andartneedsandrealizingthesootasaviableresourcewithcreat ive benefits. Air pollution is one of the primary contribution to death and diseasearound the world, so limiting and capturing air pollutant is an excellent way to protectpeople's health. If air pollutants could be recycled and repurposed into products that areusable by people, it would give people more incentive to capture air pollutants and turn anegativethingintosomethingpositive.Anewengineeringprojecthasmanagedtodojustthat,c apturingairpollutantsandturningthemintopaintsandinks.

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