



# Visvesvaraya Technological University

"Jnana Sangama"  
Belgaum-590 018, Karnataka State

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**REGISTRAR**

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Ref: VTU/Aca-Circulars/2013-2014/ 8813

Date : **28 OCT 2013**

## CIRCULAR

Sub: Organizing Awareness campaign on the need to reduce air and noise pollution, celebrate Deepavali safely - reg...

Visvesvaraya Technological University (VTU) is aware of the adverse consequences of global warming. To highlight the adverse effects of pollution on the eco-system, VTU is initiated an awareness campaign on the need to reduce air and noise pollution, in the previous academic year, VTU organized 'Walkathons' in Belgaum and its Regional centres on 7<sup>th</sup> October, 2012, on the eve of Deepavali to create awareness on the ill-effects of air and noise pollution due to bursting of crackers. Continuing the same, this year also, VTU is organising Walkathons in Belgaum and in its Regional centres, on the eve of Deepavali to create awareness on the ill-effects of air and noise pollution due to bursting of crackers.

The University would appreciate, if the affiliated institutions also organize similar rallies in the colleges on or before 31<sup>st</sup> October, 2013 to spread the message of celebrating Deepavali without bursting crackers. The rally shall exhibit the posters showing ill effects of crackers and awareness about safety measures to be taken.

All the Principals are hereby requested to bring it to the notice of all students and staff that they should celebrate Deepavali, the festival of lights, in joyous manner, but without bursting crackers and set good example for responsible students and citizens. The brief note on the awareness is enclosed.

On this occasion, Hon'ble Vice-Chancellor, VTU, Belgaum appealed to all VTU affiliated colleges, students and staff of to take oath on Deepavali that they will not burst crackers.

BY ORDER

Encl: As above

  
(Prof. K.E. Prakash) 28.10.13  
REGISTRAR

To,

1. The Principals of All Engineering Colleges (Constituent, Affiliated, Autonomous) under VTU, Belgaum
2. The PG Coordinators of all Regional centres of VTU to compulsorily organise the rally on or before 31-10-2013 and send report the Registrar, VTU, Belgaum

Copy to:

1. The Secretary to VC, VTU, Belgaum
2. The Special Officers of all the Regional Offices of VTU
3. The Special Officer of Academic Section, VTU, Belgaum
4. The Case-workers of Academic Section(A1,A2,A3,A4) VTU, Belgaum

28/10/13  
Special Officer  
V.T.U. Bangalore



# Visvesvaraya Technological University

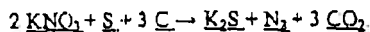
Jnana Sangama, Belgaum - 590 018

## AWARENESS ON FIRE CRACKERS USED IN DIWALI FESTIVAL

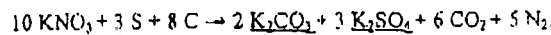
Crackers contain black granular mixture of (Black Powder),

- A nitrate, typically potassium nitrate ( $KNO_3$ ), which supplies oxygen for the reaction,
- Charcoal, which provides carbon and other fuel for the reaction, simplified as carbon (C),
- Sulfur (S), which, while also serving as a fuel, lowers the temperature required to ignite the mixture, thereby increasing the rate of combustion.

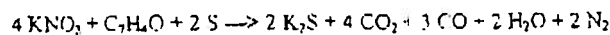
Expected chemical reactions are,



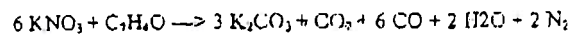
A balanced, but still simplified, equation is



An even more accurate equation of the decomposition of regular black powder with the use of sulfur can be described as



Black powder without the use of sulfur:



On burning the byproducts are about 56% of solid products may be potassium carbonate, potassium sulfate, potassium sulfide, sulfur, potassium nitrate, potassium thiocyanate, carbon, ammonium carbonate about 43% of gaseous products: carbon dioxide, nitrogen, carbon monoxide, hydrogen sulfide, hydrogen, methane rest is water.

To give different colors the Black Powder is mixed with following metals in their compounds form.

Color	Metal	Example compounds
Red	<u>Strontium</u> (intense red) <u>Lithium</u> (medium red)	$SrCO_3$ ( <u>strontium carbonate</u> ) $Li_2CO_3$ ( <u>lithium carbonate</u> ) $LiCl$ ( <u>lithium chloride</u> )
Orange	<u>Calcium</u>	$CaCl_2$ ( <u>calcium chloride</u> )
Yellow	<u>Sodium</u>	$NaNO_3$ ( <u>sodium nitrate</u> )
Green	<u>Barium</u>	$BaCl_2$ ( <u>barium chloride</u> )
Blue	<u>Copper</u>	$CuCl$ ( <u>copper chloride</u> ) at low temperature
Indigo	<u>Cesium</u>	$CsNO_3$ ( <u>cesium nitrate</u> )
Violet	<u>Potassium</u> <u>Rubidium</u> (violet-red)	$KNO_3$ ( <u>potassium nitrate</u> ) $RbNO_3$ ( <u>rubidium nitrate</u> )
Gold	<u>Charcoal</u> , iron, or <u>lampblack</u>	
White	<u>Titanium</u> , aluminum, <u>beryllium</u> , or <u>magnesium</u> powders	



Many of the chemicals used in the manufacture of fireworks are non-toxic, while many more have some degree of toxicity, can cause skin sensitivity or exist in dust form and are thereby inhalation hazards. Still others are poisons if directly ingested or inhaled.

Special Officer,  
V.T.U., Bangalore

## TIPS FOR A SAFE DIWALI

### Do's:

An adult should always supervise the use of fireworks by children.

- Check the area before igniting fireworks to ensure that all inflammable and combustible materials are removed
- Follow all safety precautions issued with the fireworks
- Use a candle or an agarbathi to ignite fireworks. They burn without an open flame and provide a greater and safer distance between your hands and the fireworks
- Open flames from matches and lighters can cause additional fire hazards.
- Keep a fire extinguisher or bucket of water nearby to extinguish any incipient fire
- Keep burn ointments handy
- Use fireworks only outdoors.
- Wear protective goggles while lighting fireworks to prevent eye injuries
- Light only one firework at a time.
- Firecrackers, bombs and flowerpots should not be lighted holding them. It is always safer to light them from the side without bending over them
- Move away quickly before they burst
- Hold lighted sparklers away from the body.
- Flying fireworks - rockets, missiles, etc. - should always be lighted in open grounds pointing straight up.
- Discard used fireworks in a bucket of water.
- Wear close-fitting clothes of thick material instead of loose or flowing garments.
- Store fireworks in a cool and dry place.
- Consult an ophthalmologist immediately in case of eye injuries



### Don'ts:

Never give fireworks to small children

- Never ignite fireworks while holding them. Put them down, then ignite them and walk away.
- Do not put fireworks in any container to ignite.
- Never mix anything with the contents of fireworks or make fireworks at home
- Never ignite aerial fireworks where overhead obstruction (trees, wires, etc.) may interfere with trajectory into open air space
- Never ignite an aerial firework near an opening to a building
- Never use fireworks inside a vehicle
- Never re-light a firework which has not burnt properly. Wait for 15 to 20 minutes and then soak it in a bucket of water.
- Never throw or point fireworks at other people
- Never carry fireworks in your pocket
- Never shoot fireworks in metal or glass containers.
- Ensure that your children don't engage in dangerous pranks such as throwing lighted crackers or sparklers at others, or try to make fireworks themselves.

Following these precautions can go a long way in ensuring a safe Diwali.

### **How to Celebrate Eco-Friendly Deepawali?**

Listing the various environmental and health hazards caused due to present form of Diwali celebration doesn't mean to stop celebrating the festival. But definitely the way of celebrating this auspicious festival can be changed. Listed below are few environment friendly tips to celebrate Diwali 2012:

- Instead of individual celebration prefer community celebration. With the increasing trend of gated community all the families of the community can celebrate Diwali in the common space. This will ensure reduced cost of celebration; paper pollution in a limited space and as compared to individual celebration, community celebration will cause less air and noise pollution.
- Even while celebrating commonly make sure that you limit your celebration for a limited period of time. Your celebration can last for maximum 3 to 4 hours
- Before selecting the place for common community celebration make sure that it is far away from hospitals. Instead of selecting crowded areas it is better to opt an open ground
- Instead of selecting traditional chemical cracker this Diwali go for eco-friendly crackers. Eco-friendly crackers are made up of recycled paper and the sound produced by these crackers is under the decibel limit defined by the Pollution Board. These crackers produce paper fluffers and different color lights instead of sound on bursting.

Some of the effects on the Environment:

- Excessive Air Pollution
- Excessive Noise Pollution
- Soil Pollution
- Excessive Power Consumption
- Consumerism (Excess consumption means excess use of raw material)

Besides these environmental effects the modern style of celebrating Diwali also leads to various health hazards. Some of the major health hazards are listed below:

- Hearing Loss
- High Blood Pressure
- Sleeping Disturbances
- Asthma
- Headache
- Irritability
- Skin Allergies
- Fatigue
- Eye Related Problems
- Respiratory Problems

Combustion characteristics of firecrackers:

The burning of gunpowder does not take place as a single reaction, however, and the byproducts are not easily predicted. One study's results showed that it produced (in order of descending quantities) 55.91% solid products: potassium carbonate, potassium sulfate, potassium sulfide, sulfur, potassium nitrate, potassium thiocyanate, carbon, ammonium carbonate and 42.98% gaseous products: carbon dioxide, nitrogen, carbon monoxide, hydrogen sulfide, hydrogen, methane, 1.11% water.

For persons with asthma or multiple chemical sensitivity the smoke from fireworks may aggravate existing health problems. Environmental pollution is also a concern because heavy metals and other chemicals from fireworks may contaminate water supplies. The most consumer fireworks leave behind a considerable amount of solid debris, including both readily biodegradable components as well as non-degradable plastic items. Concerns over pollution, consumer safety, and debris have restricted the sale and use of consumer fireworks in many countries.

Harmful effects of Chemicals used in crackers:

Let's do a little analysis of crackers and list out in actual terms the harmful effects posed by each of its chemicals

Chemical	Impact
Copper	Irritation of respiratory tract
Cadmium	Anemia and damage to kidney
Lead	Affects the nervous system
Magnesium	Its dust and fumes cause metal fume fever Reacts violently with moisture and can attack the skin
Sodium	Reacts violently with moisture and can attack the skin
Zinc	Leads to vomiting
Nitrate	Could lead to mental impairment
Nitrite	Could lead to coma

Noise Pollution caused by Fire Crackers

Crackers that make a noise of more than 125 decibels at four metres distance from the point of bursting are banned by the law. Given here are the hazards posed by excessive noise pollution caused by crackers

1. Hearing loss, high blood pressure, heart attack and sleeping disturbances.
2. Sudden exposure to loud noise could cause temporary deafness or permanent relative deafness.

- Instead of electric illumination go for traditional lightening of earthen lamps or diyas. This will not only enhance the beauty of your house but will also cut down the enormous electric consumption. Though earthen lamps need oil but the quantity is less and it gives light for at least 3-4 hours.
- Cut down your shopping list and avoid purchasing unwanted and unnecessary things this Diwali. Excess consumerism is directly related to the consumption of raw material used to manufacture those things. Excessive consumerism increases the undue pressure on the natural resources.
- Instead of buying "one-time use" items go for recyclable things. Secondly while cleaning your home for Deepawali instead of disposing things it is better to give it to under-privilege people.



HAPPY DEEPAVALI & SAFE DEEPAVALI



4/4



Special Officer  
V.T.U. Bangalore