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Study of opposite Physical nearby conditions

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In case like superconductivity,effect on Health food presevertation fruit ripening etc. the effects of opposite physical conditions are quite similar. Although the mechanic aspects may differ in the opposite conditions associated with similar effects.

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I. Introduction

When there is an extreme weather conditions, there is an adverse effect on physical and biological conditions. The regions in which weather variation are caught in the grip of the harsh cold wave during the winter, and a strong hot, and dry wind known as Loo during the day time in the summer. Almost all people think of winter as the season for dry, itchy, cracked and moisture deprived the skin problems. In summer season when physical conditions are opposite of very hot and dry conditions, can be equally troublesome for the skin. Similarly in case of food preservation, super conductivity etc.the effects of opposite physical conditions characterised by low and high temperature conditions are nearly same. Similarly the Health diseases like Cold, Cough, Fever etc. are more like to happen at low and high temperature. Also the fruit ripening is similar at low and high temperature conditions. Although, the mechanistic aspect may be different in opposite conditions associated with similar effects.

II. Conduction :

Temperature :

The super conductivity phenomemon which was discovered on April 8, 1911 by Kammerling Onnes in leiden superconductivity is observable in both low and high temperature conditions. The material which show superconductivity (zero electrical resistivity) at very low temperature are called low Tc-superconductors. Tc is known as the critical temperature at which a material become superconductor in zero magnetic field. For example, solid mercury has Tc = 4.18 K. At that time i.e. in 1911, it was a revolutionary discovery and it was hope that it will change the life of human beings but problem was the very low critical temp. The mechanism of superconductivity was explained by B.C.S. theory (published in 1957 in paper classic). The theory states that electron - electron pairs (cooper pairs) are held together by an attraction mediated by phonons. The central phenomenon of superconductivity is meissner effect (exclusion of magnetic field by super conductor).[5]

The high temperature superconductivity hoped was left because upto 1986 we have only low Tc super conductors (have Tc < 23 K). In 1986 Bednorz and Muller discovered ceramic super conductor having Tc 34 K and got nobel prize for it. The superconductors having Tc (> 34 K) are known as high Tc superconductors. Thus the high temperature conditions have also the effect of making substances to show the high temperature superconductivity at which the material also show zero electrical resistance and magnetic field exclusion. The cuperate super ceductor $YBa_2Cu_3O_7$ one of the First cuperate superconductor can have much critical temperature (90). The cuperate supercenductors upto now have been discovered having Tc = 130K. The BCS theory (which was applicable in case of low Tc superconductors) is not applicable in case of high Tc superconductors. The best available model still is crude. There are currently two main hypothesis - the resonating valence bond theory, and spin fluctuation which has the most support by researchers[1]. The second hypothesis proposed that electron pairing in high temperature super conductors is mediated by short range spin waves known as paramagnons.

Pressure :

The super conductor material show a change in critical temperature (Tc) (Temperature below which material is super conductor) with pressure. There are few elements sule as thallium (Tc = 2.38 K) for which Tc is low at low pressure as well at high pressure[2].

This unusual Tc dependence on pressure for thallium might be due to a modification of electronic configuration under pressure[4] and change in fermi surface[3].

HEALTH EFFECTS :

Temperature :

The effects of both high and low temperatures have nearly same effects on health. Both conditions have adverse effect on health and prevention and protection from these adverse effect is also nearly same.

Skin :

As winter is the season of dry and itchy skin similarly summer weather can be equally troublesome for skin causing dryness and itchiness. In both seasons, the skin is deprived of moisture.

In summer the skin dryness is because of high temperature, heat and skin exposure to sun light. High temperatures are a major part of summer that can be held responsible of dry skin in the summer heat can dehydrate the skin and cause dry skin conditions such as eczema in the form of red pus -filled spits or even blistering, irritated, inflamed patches of skin. The heat of the sun dries out the skin by reducing the natural oils in the skin, leaving it very dehydrated and in need of moisture. The skin gets dry and itchy during cold weather due to both external and internal reasons.

External causes :

Cold air has absolute humidity low (absolute humidity, i.e. the volume of water divide by volume of air). Low humidity during winter, both outside and inside the house, enhances the drying effect on the skin.

Internal causes :

When skin becomes cold, the blood vessels supplying the skin become constricted. This reduces blood flow to the skin and sweat glands and oil producing glands in the body. When the water content of the skin diminishes both inside and outside, the skin cells become shrunken and dry.

The methods for prevention and protection from dry and itchy skin problems in winter and summer are same. Before going outside protect your most sensitive parts (lips, hands, face) with a scarf and gloves. The relief in both cases is by the use of a sunscreen lotion variety.

To keep skin smooth and supple drink plenty of water and fluids, take balanced food containing all nutrients including vegetables, fruits and fresh fish in your daily food intake, avoid chocolates, red meats, spicy fried food and fast foods as they will irritate the dry skin, avoid alcohol and coffee as they will dehydrate the skin and predispose to more drying and itching.

Loo and cold, hyperthermia and hypothermia. The extreme temperature conditiokns of summer and winter may cause one to suffer from loo and cold, respectively. The protection from both the cold and loo is from covering the body by scarf around head and face, and gloves on hand, and glasses on eyes. In both the sufferings, the doctor prescribes the rest and intake of plenty of water and fluids.

The sufferings caused to one from summer and cold leads to disturbance in the temperature equilibrium of the body (body temperature may go up or go down).

Both the high body temperature (Hyperthermia) and low body temperature (Hypothermia) puts life at risk.

Iron, Vitamins, Food, etc. : The intake of Iron, Vitamins, Food, etc. out of safe range is also causes same effect to the health and life. Both the low and higher levels of these nutrients have similar effect on health (i.e. harm to health and life).

FOOD PRESERVATION :

Temperature : Both the low and high temperature conditions have effect of food preservation, albeit the mechanism is different. For example, the food like milk can be preserved by keeping it in freeze and also by boiling and warming it intermittently. In general, low temperatures reduce the growth rates of microorganisms and slow many of the physical and chemical reactions that occur in foods.

The use of high temperature conditions (Heat) may be used for preserving the food. Canning involves cooking food, sealing it in sterile cans or jars, and boiling the conainers to kill or weaken any remaining bacteria as a form of sterilization.

Pressure : The effects of high and low pressure are also similar on food preservation. The food can be preserved at very high and low pressure as well though techniques called Pascalization and Vacuum packaging, respectively.

High pressure processing technique called Pascalization. (also called bridgmanization) is a method of preserving and sterilizing food. In this technique a product to be preserved is processed under very high pressure. This high pressure causes inactivation of certain microorganisms and enzymes in the food.

The low pressure technique called Vacuum packaging can be used to preserve food for some time. This technique is based on Vacuum. Vacuum is space that is devoid of matter. An approximation to such vacuum is a region with a gaseous pressure much less than atmospheric pressure.

Vacuum packaging[6] is a method of packaging that removes air from the package prior to sealing. Thus method involves. Vacuum packing reduces atmospheric oxygen, limiting the growth of aerobic bacteria or fungi, and preventing the evaporation of volatile components.

III. Conclusion

Some extreme situations of physical enviorment (like temperature,pressure,etc.) have nearly same effect on some physical phenomenon like the food preservation, Conductivity Although, the mechanistic aspect of matching effects during the opposite conditions may be different.

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