Health hazards of industrial chemicals

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‘SOCIETY has understood for centuries the harm posed by many natural and synthetic substances, often through casual observation of diseases that have beset workers in various dirty industry,” commented Ann Misch, a research associate at the Washington-based Worldwatch Institute.

Misch cites lead as a case in point. This soft, bluish-gray heavy metal that resists corrosion is part of many different manufacturing processes. Lead is used in batteries, fishing weights, ammunition, solder, ceramic glaze, and in paint applied to bridges and the hulls of ships.

A person may suffer from lead poisoning if he inhales the fumes containing lead or ingests particles containing lead, such as from lead paint. “Lead poisoning can cause acute illness, such as vomiting, or chronic illness, such as permanent damage to the nervous system, as lead accumulates in the body over long periods,” warns H. Steven Dashefsky, author of Environmental Literacy: Everything You Need to Know About Saving Our Planet.

According to Misch, lead can create intelligence quotient (IQ) deficits of up to eight points in children, without any outward, recognizable signs of damage.

Lead’s health hazards were recognized even in the ancient times. Hippocrates noted cases of lead poisoning among miners in the fourth century B.C. Dioscerides, a Greek physician, reported in the second century B.C. that “lead makes the mind give way.”

Lead and lead compounds have been banned in the US since 1977. These, however, are still added as anti-corrosive pigments and driers to architectural or household paint formulations by some paint manufacturers, according to EcoWaste Coalition.

A test commissioned by the group in 2010 to determine levels of lead in paint products sold locally showed 69 percent of the 35 samples were found to contain huge amounts of lead. One sample contained 161,700 parts per million (ppm) of the toxic metal—way above the US regulatory limit for lead in paint of 90 ppm.

Some years ago, the EcoWaste Coalition conducted a “State of Toys Analysis.” The group found that 30 percent of the 200 locally available toys tested contained toxic metals such as lead, antimony and cadmium.

The group also said the World Health Organization (WHO) has ascertained there is no safe level of childhood lead exposure.

“We are deeply alarmed by the unhindered use of hazardous chemicals in stuff that we find in the market today, many of them are reproductive and developmental toxins, carcinogenic and toxic to the brain,” EcoWaste Coalition President Manny Calonzo said in a press statement.

Like lead, dioxin is another threat to human health. “Outside the workplace, lead primarily threatens the central nervous system, but dioxin appears capable of interfering with a number of physiological systems,” deplored Misch, who has been studying the link between health and the environment for the institute.

Dioxin is a toxic chemical product created by the paper industry’s chlorine bleaching, by waste incineration, and as an unintended by-product of the manufacture of a pesticide and a wood preservative.

The UN health agency calls dioxins as environmental pollutants. “They have the dubious distinction of belonging to the ‘dirty dozen’—a group of dangerous chemicals known as persistent organic pollutants,” WHO
Hazard, predatory "Since principally converted through Mercury manufacture, Chromium liver say Arsenic rare, Antinomy Other functions. Misch is There food chemical explains. "Dioxins are of concern because of their highly toxic potential. Experiments have shown they affect a number of organs and systems. Once dioxins have entered the body, they endure a long time because of their chemical stability and their ability to be absorbed by fat tissue, where they are then stored in the body. Their half-life in the body is estimated to be seven to 11 years. In the environment, dioxins tend to accumulate in the food chain. The higher in the animal food chain one goes, the higher the concentration of dioxins."

There are 75 dioxins known to science. Of these, the most toxic is the tongue-twisting tetrachlorodibenzo-p-dioxin. It is found in Agent Orange, a defoliant used widely during the Vietnam War.

Misch said more than 90 percent of exposure to dioxin comes from food, particularly meat, dairy products and fish.

Research studies have shown that low-level exposure to dioxin damages the immune system and reproductive functions. Dioxin also appears to affect behavior and learning ability, which suggest that it is a neurotoxic.

In the 1980s dioxin was believed to be the most potent animal carcinogen (a substance that can cause cancer) ever known. In recent years, intense controversy has cropped up over the true nature of dioxin's toxicity in people.

Other industrial chemicals, which pose health hazards include antimony, arsenic, cadmium, chromium and mercury.

Antimony is used in the manufacture of foil, batteries, ceramics, safety matches, and textiles. Although fatalities are rare, it irritates the mucous membranes and tissues.

Arsenic in large doses is well known to be poisonous, but it is now also known to cause certain types of cancer. It has caused severe health problems in drinking water in Asia and in South and North America.

Cadmium is used in plating metals and solders. It is soluble in acid foods like fruit juices and vinegar. Health experts say that ingestion of as little as 10 milligrams causes marked symptoms. Severe gastrointestinal inflammation and liver and kidney damage can result.

Chromium is used in steel-making, electroplating, leather tanning and as radiator anti-rust inhibitor. It irritates the eyes and destroys human cells.

Mercury is used in chemical manufacturing processes, in electrodes for certain electrolytic processes, in thermometer manufacture, in certain paints, in dental amalgam and in laboratory processes.

Mercury and many of its chemical compounds, especially organomercury compounds, can also be readily absorbed through direct contact with bare, or in some cases (such as dimethylmercury) insufficiently protected skin.

When it is breathed, mercury can produce effects on the nervous system and on the kidney and skin after being converted in the body to inorganic mercury compounds. However, mercury is most toxic when it is converted, principally by microorganisms in the aquatic environment, to methylmercury.

"Since methylmercury is very stable," a WHO publication explains, "it accumulates in the food chain and especially in predatory fish. People who eat large quantities of these fish are therefore particularly at risk."

Meanwhile, WHO suggests: "The number of new chemicals being developed far exceeds the capacity of toxicology to identify the exact impact of these substances on human health. Programs aimed at educating employers and employees on the health risks of industrial chemicals deserve a high priority."