

Benzidine Dyes

Background

In use since the late nineteenth century, benzidine is an organic chemical used predominantly in the production of dyes. It has been used as an intermediate in the manufacture of benzidine-based dyes for the leather, textile and paper industries. There are approximately 45 to 50 benzidine dyes currently in commerce worldwide.

Health concerns about benzidine can be traced back as early as 1906 when a report was published on the correlation between benzidine exposure and bladder cancer in humans. As more evidence became available on the health affects of benzidine, European dye manufacturers, in the early 1970s, voluntarily stopped manufacturing benzidine dyes. However, at the time, neither the use of benzidine dyes nor the dyed goods themselves were considered to pose a health risk.

Environmental Issues

Benzidine is a toxic chemical that can result in harmful health effects from long-term exposure. The highest levels of benzidine were reported in workers at benzidine production plants, especially at plants with poor and unsanitary working conditions. Prior to 1940, reports suggested that benzidine induced bladder cancer in exposed workers. It was not until an epidemiological study of UK workers exposed to benzidine over the period from 1921-1950 that conclusive evidence of the carcinogenic nature of benzidine was provided. Other studies in Japan, France, US, Russia and Germany supported the conclusion that there is a high risk of bladder cancer in exposed workers.

Voluntary and Non-Regulatory Initiatives (VNRIIs)

As the risks associated with the use of benzidine became more evident, regulations in the United Kingdom prohibited its use. Four years later, in 1971, Bayer, a major European manufacturer of benzidine, decided to cease manufacturing the chemical. This prompted many European dye

manufacturers to voluntarily stop production of benzidine dyes. Other factors contributed to this voluntary action:

- Benzidine dyes can readily regenerate into benzidine through a chemical reduction, for instance, through a cleaning liquid that contains reducing agents.
- Exposure to benzidine dyes can result in exposure to benzidine because the dyes can be metabolized in the body to give benzidine.

This voluntary initiative reduced the occupational risks associated with the manufacture of benzidine and benzidine dyes. In addition, it probably reduced the occupational exposure to benzidine dyes in the leather, textile and paper industries because of the partial replacement of benzidine in dyes. Overall, the initiative resulted in approximately 90 per cent of European manufacturers voluntarily stopping the production of benzidine dyes.

Effects of VNRIIs on Trade and Investment