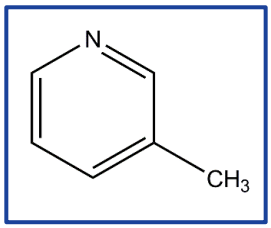
SUMMARY

Background: β-Picoline is used as a solvent in the making of pharmaceuticals, insecticides, resins, and dyes. It is related in structure to pyridine, which causes cancer in laboratory animals. Humans can be exposed to β-picoline through contaminated water or food, air, and skin contact with products containing the solvent. The effects of exposure to β-picoline in drinking water in male and female rats and mice were studied to identify potential toxicity or cancer-related outcomes.



Methods: Groups of 50 male and 50 female rats were given drinking water containing 156.25, 312.5, or 625 milligrams (mg) of β-picoline per liter (L) of water for 2 years. Similar groups of male and female mice were given 312.5, 625, or 1,250 mg/L of β-picoline. Control animals received 0 mg/L (the same tap water with no chemical added). Additional 3-month studies were conducted to set appropriate doses and identify target organs for subsequent studies. The animals were monitored for body weight changes and water consumption throughout the studies. Tests were conducted to evaluate the potential for β-picoline to cause DNA damage. At the end of the study, tissues from more than 40 sites from every animal were examined for signs of disease.

Results: Decreases in the body weights of male and female mice and decreases in water consumption in male and female rats were observed with β-picoline exposure. Female rats and male and female mice exposed to β-picoline had increased rates of lung neoplasms (which can include benign or malignant growths). Female mice receiving β-picoline had increased rates of malignant neoplasms of the liver. Other effects observed included noncancerous tissue abnormalities in the lung of female mice and in the nose of male and female mice exposed to β-picoline. Tests to evaluate the potential for β-picoline to damage DNA were negative.

Conclusions: *The NTP four-point scale rates the level of evidence that a substance has the ability to cause cancer in laboratory animals. Under the conditions of these 2-year drinking water studies, there was clear evidence that β-picoline exposure has the ability to cause lung and liver cancer in female mice, some evidence that it has the ability to cause lung cancer in female rats, equivocal (uncertain) evidence that it has the ability to cause lung cancer in male mice, and no evidence that it has the ability to cause cancer in male rats. In addition, β-picoline exposure caused increased incidences of noncancerous tissue abnormalities in the lung in female mice and in the nose in male and female mice.*