

## **N-BENZYLPIPERAZINE**

(Street Names: BZP, A2, Legal E, Legal X)

### **Introduction:**

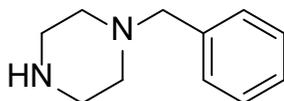
N-Benzylpiperazine (BZP) was first synthesized in 1944 as a potential anti-parasitic agent. It was subsequently shown to possess antidepressant activity and amphetamine-like effects but was not developed for marketing. The amphetamine-like effects of BZP attracted the attention of drug abusers. Since 1996, BZP has been abused by drug abusers; as evidenced by the encounters of this substance by law enforcement officials in various states and the District of Columbia. The Drug Enforcement Administration (DEA) placed BZP in schedule I of the Controlled Substances Act due to its high abuse potential and lack of accepted medical use or safety.

### **Licit Uses:**

BZP is used as an intermediate in chemical synthesis. It has no known medical use in the United States.

### **Chemistry:**

BZP is an N-monosubstituted piperazine derivative available as either base or the hydrochloride salt. The base form is a slightly yellowish-green liquid. The hydrochloride salt is a white solid. BZP base is corrosive and causes burns. The salt form of BZP is an irritant to eyes, respiratory system and skin. The structure of BZP is shown below:



### **Pharmacology:**

Both animal studies and human clinical studies have demonstrated that the pharmacological effects of BZP are qualitatively similar to those of amphetamine. BZP fully substitutes for the discriminative stimulus effects of amphetamine in animals. BZP is self-administered by monkeys, indicating reinforcing effects. Subjective effects of BZP were amphetamine-like in drug-naïve volunteers and in volunteers with a history of stimulant dependence. BZP acts as a stimulant in humans and produces euphoria and cardiovascular effects, namely increases in heart rate and systolic blood pressure. BZP is about 10 to 20 times less potent than amphetamine in producing these effects. Experimental studies demonstrate that the abuse, dependence potential, pharmacology, and toxicology of BZP are similar to those of amphetamine. Public health risks of BZP are similar to those of amphetamine.

### **Illicit Uses:**

BZP is often abused in combination with 1-[3-(trifluoromethyl)phenyl]piperazine (TFMPP), which is a

noncontrolled substance. This combination has been promoted to the youth population as a substitute for 3,4-methylenedioxymethamphetamine (MDMA) at raves (all-night dance parties). However, there are no clinical studies that directly compared the behavioral effects of BZP to those of MDMA. BZP may also be abused alone for its stimulant effects. BZP is generally administered orally as either powder or tablets and capsules. Other routes of administration included smoking and snorting. In 2001, a report from University in Zurich, Switzerland described the death of a young female that was attributed to the combined use of BZP and MDMA. There have also been several life-threatening incidents that resulted in emergency department admissions following the ingestion of BZP.

### **User Population:**

Youth and young adults are the main users of BZP.

### **Illicit Distribution:**

DEA's National Forensic Laboratory Information System (NFLIS) Drug database collects scientifically verified data on drug items and cases submitted to and analyzed by participating federal, state, and local forensic drug laboratories. NFLIS-Drug received a peak number of BZP reports in 2009 (15,053 reports). The annual number of reports decreased since then, except in 2014 (3,082 reports). NFLIS-Drug received 545 reports of BZP in 2015, 15 in 2020, 10 in 2022, and 11 in 2024 (reports still pending).

Illicit distributions occur through the smuggling of bulk powder through drug trafficking organizations with connections to overseas sources of supply. The bulk powder is then processed into capsules and tablets. BZP is encountered as pink, white, off-white, purple, orange, tan, and mottle orange-brown tablets. These tablets bear imprints commonly seen on MDMA tablets, such as housefly, crown, heart, butterfly, smiley face, or bull's head logos and are often sold as "ecstasy." BZP has been found in powder or liquid form that is packaged in small convenience sizes and sold on the Internet.

### **Control Status:**

BZP is controlled in schedule I of the Controlled Substances Act.