

5F-AEB (5F-EMB-PINACA)

Introduction:

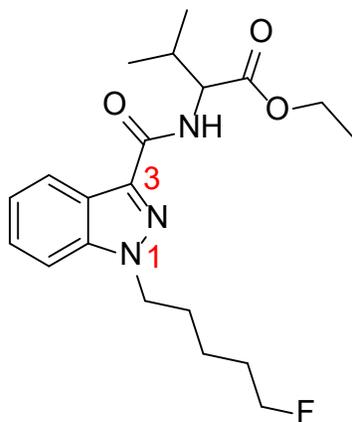
Synthetic cannabinoids, often referred to as "Spice" or "K2," are laboratory-made chemicals designed to mimic the effects of Δ^9 -tetrahydrocannabinol (Δ^9 -THC), the major psychoactive compound found in marijuana. 5F-AEB is a potent synthetic cannabinoid that was first encountered on the designer drug market in 2016 by law enforcement. This substance has been found to be laced on plant materials, present in vaped products, and marketed under the guise of herbal incense products.

Licit Uses:

There are no commercial or medical uses for 5F-AEB.

Chemistry:

The chemical structure for 5F-AEB¹ is shown below.



5F-AEB is based on an indazole core structure, where the 1- and 3-positions of the indazole ring system are substituted. The 1-position of 5F-AEB is substituted with a linear five-carbon chain terminated with a fluorine (F) atom. The 3-position is substituted with an amide linker, and the nitrogen atom (N) of this linker is further substituted with a 1-ethoxy-3-methyl-1-oxobutan-2-yl group.

Pharmacology:

Data from preclinical studies show that 5F-AEB binds to and acts as an agonist at the cannabinoid type 1 (CB1) receptor. In drug discrimination studies in rats, 5F-AEB partially generalized to Δ^9 -THC (i.e., produced subjective effects similar to those of Δ^9 -THC) at low doses; however, at the higher dose needed to produce full substitution, severe adverse effects were observed, and the study was discontinued. In locomotor activity assays in mice, 5F-AEB was approximately 20 times more potent than Δ^9 -THC.

There are no published studies on the safety of 5F-AEB for human use. 5F-AEB is found in synthetic cannabinoid products used for smoking or vaping. There are reports of adverse effects from 5F-AEB use, such as hallucinations, anxiety, psychosis, and seizures. Some studies report that synthetic cannabinoid use, including use of vape products containing 5F-AEB, can cause serious health problems like heart attacks and strokes.

America's Poison Centers continue to report adverse health effects in response to the abuse of synthetic cannabinoids, and this abuse is both a public health and safety concern.

Illicit Uses:

5F-AEB has been found in synthetic cannabinoid products that are smoked or vaped for their psychoactive effects.

User Population:

Information on user population in the United States is limited; however, studies suggest that adolescents and young adults (15 - 24 years old) may be the most likely users of synthetic cannabinoid products containing 5F-AEB. 5F-AEB abuse is not monitored by any national drug abuse surveys.

Illicit Distribution:

The Drug Enforcement Administration'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 over 200 reports of 5F-AEB since it was first reported in 2016.

Control Status

5F-AEB is a positional isomer of the schedule I controlled substance 5F-ADB (methyl 2-(1-(5-fluoropentyl)-1H-indazole-3-carboxamido)-3,3-dimethylbutanoate), as defined by 21 CFR 1300.01, and is therefore also a schedule I controlled substance under the Controlled Substances Act as of April 10, 2017 (Federal Register 2017; 82:17119).

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section; Fax 571-362-4250, Telephone 571-362-3249, or Email DPE@dea.gov.

¹ Chemical name: Ethyl 2-(1-(5-fluoropentyl)-1H-indazole-3-carboxamido)-3-methylbutanoate