

## AKB48 (APINACA) and 5F-AKB48 (5F-APINACA)

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### Introduction:

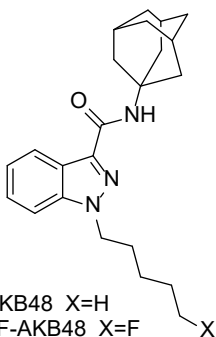
Various synthetic cannabinoids (e.g., JWH-018, JWH-073, etc.) laced on plant material have been encountered by law enforcement in recent years. These are promoted under the guise of herbal incense products. These products laced with synthetic cannabinoids are smoked for their psychoactive effects. In response to state and federal control of these synthetic cannabinoids, a transition to new synthetic cannabinoids laced on plant material has been observed. AKB48 and 5F-AKB48 are two such synthetic cannabinoids recently encountered on the designer drug market.

### Licit Uses:

AKB48 and 5F-AKB48 were not previously reported in the scientific literature prior to their appearance on the designer drug market. There are no commercial or medical uses for these substances.

### Chemistry:

AKB48 and 5F-AKB48 are also known as *N*-(1-adamantyl)-1-pentyl-1*H*-indazole-3-carboxamide and *N*-(1-adamantyl)-1-(5-fluoropentyl)-1*H*-indazole-3-carboxamide, respectively. Their chemical structures are shown below.



### Pharmacology:

AKB48 is pharmacologically similar to schedule I substances THC and various synthetic cannabinoids (e.g., JWH-018, AM2201 etc.). In vitro studies show that AKB48 and 5F-AKB48, similar to  $\Delta^9$ -THC and various synthetic cannabinoids, binds to the brain cannabinoid CB1 receptors and displays agonist properties in functional assays. In drug discrimination studies in rats, AKB-48 generalized to  $\Delta^9$ -THC, i.e. produced subjective effects similar to those of  $\Delta^9$ -THC. In the tetrad assay, 5F-AKB48, like  $\Delta^9$ -THC, functioned as a cannabinoid agonist in vivo.

There are no published studies as to the safety of AKB48 or 5F-AKB48 for human use.

### Illicit Uses:

AKB48 and 5F-AKB48 have been encountered as adulterants in numerous herbal products that are smoked for their psychoactive effects.

### User Population:

Information on user population in the U.S. is limited, and includes information from drug user internet forums. AKB48 and 5F-AKB48 abuse is not monitored by any national drug abuse surveys. Poison control centers continue to report adverse health effects in response to the abuse of herbal incense products and this abuse is both a public health and safety concern.

### Illicit Distribution:

The System to Retrieve Information from Drug Evidence (STRIDE)/STARLiMS is a federal database for the seized drugs analyzed by DEA forensic laboratories and the National Forensic Laboratory Information System (NFLIS) is a system that collects drug analysis information from state, local, and federal forensic laboratories. NFLIS and STRIDE/STARLiMS contain 47 reports for AKB48 in 2011. In 2012, these databases contain 527 reports for AKB48 and 162 reports for 5F-AKB48 or Fluoro-AKB48 (isomer undetermined). More recently, in 2017 and 2018, AKB48 had 143 and 46 reports and 5F-AKB48 had 67 and 10 reports, respectively in NFLIS. Bulk quantities and plant material (herbal incense products) laced with AKB48 and 5F-AKB48 have been encountered. For 2019, preliminary data indicate 5 drug reports for AKB48 and 3 reports for 5F-AKB48.

### Control Status:

AKB48 and 5F-AKB48 are schedule I controlled substances under the federal Controlled Substances Act.

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section; Fax 571-362-4250, Telephone 571-362-3249, or E-mail [DPE@usdoj.gov](mailto:DPE@usdoj.gov).