

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

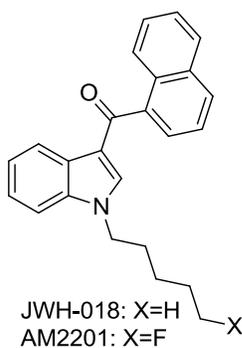
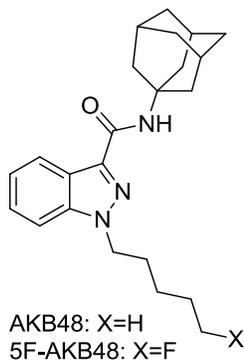
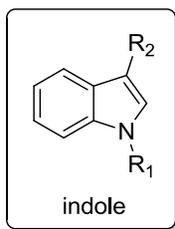
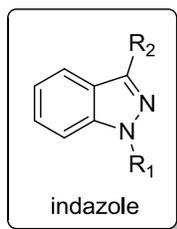
May 2013  
DEA/OD/ODE

### 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.

### Chemistry:

The chemical structures for AKB48<sup>1</sup>, and 5F-AKB48<sup>2</sup> are shown below.



AKB48 and 5F-AKB48 belong to a structural class with a core indazole structure. They are structurally related to other synthetic cannabinoids with a core indole structure, such as the Schedule I substances JWH-018 and AM2201. These core structures (scaffolds) are substituted at the 1- and 3-positions ( $R_1$  and  $R_2$ , respectively) to give rise to these substances.

### 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, similar to  $\Delta^9$ -THC and various synthetic cannabinoids, binds to the brain cannabinoid CB1 receptors and displays agonist properties in functional assays, suggesting that it would have the same in vivo effects as  $\Delta^9$ -THC and various synthetic cannabinoids. The binding affinity of AKB48 is higher than that of  $\Delta^9$ -THC. Based on structure-activity relationship studies, 5F-AKB48 is expected to bind to CB1 receptors as well.

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

### 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.

### 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) 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 and local forensic laboratories. NFLIS and STRIDE contain 47 reports for AKB48 in 2011. In 2012, these databases contain 527 reports for AKB48 and 81 reports for 5F-AKB48 or Fluoro-AKB48 (isomer undetermined). Bulk quantities and plant material (herbal incense products) laced with AKB48 and 5F-AKB48 have been encountered.

### Control Status:

AKB48 is a schedule I controlled substances under the Federal Controlled Substances Act. If intended for human consumption, 5F-AKB48 may be treated as a "controlled substance analogue" under the CSA pursuant to 21 U.S.C §§802(32)(A) and 813.

Comments and additional information are welcomed by the Drug and Chemical Evaluation Section; Fax 202-353-1263, telephone 202-307-7183, or E-mail ODE@usdoj.gov.

<sup>1</sup>Chemical name: N-(1-adamantyl)-1-pentyl-1H-indazole-3-carboxamide

<sup>2</sup>Chemical name: N-(1-adamantyl)-1-(5-fluoropentyl)-1H-indazole-3-carboxamide