



## EU EARLY WARNING SYSTEM FORMAL NOTIFICATION

Date issued	22 December 2022	RCS ID	EU-EWS-RCS-FN-2022-0040
Issued by	EMCDDA	Transmitted by	Action on New Drugs Sector, EMCDDA
Subject	Formal notification of 2-(ethylamino)-2-(3-fluorophenyl)cyclohexan-1-one (fluorexetamine) as a new psychoactive substance under the terms of Regulation (EC) No 1920/2006 and Council Framework Decision 2004/757/JHA		

### 1. Read me first

This document provides formal notification of the analytical identification of 2-(ethylamino)-2-(3-fluorophenyl)cyclohexan-1-one (fluorexetamine) for the first time in Europe.

Please report any additional data you have on this substance to: [ews@emcdda.europa.eu](mailto:ews@emcdda.europa.eu)

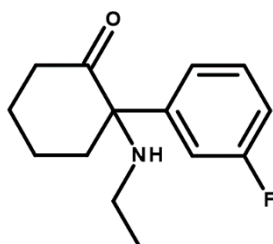
### 2. Data use restrictions

As with all formal notifications issued by the EU EWS remember that they may contain information that could be regarded as sensitive. Should you provide some of the information in this notification to other groups we would ask that you exercise your best judgment on what information needs to be provided. If you have any questions in this respect, please contact us.

### 3. Names of substance and other identifiers

- IUPAC name: 2-(ethylamino)-2-(3-fluorophenyl)cyclohexan-1-one
- Chemical names: 2-(ethylamino)-2-(3-fluorophenyl)cyclohexanone
- Common name: fluorexetamine
- Other names: FXE; 3-fluoro-2-oxo-PCE; 3F-O-PCE; 3-fluoro-deschloro-*N*-ethylketamine
- Chemical formula: C<sub>14</sub>H<sub>18</sub>FNO
- Molecular weight: 235.30
- CAS Registry number: not registered.
- InChIKey: FCETYWCLCUZFI-UHFFFAOYSA-N

Molecular structure



#### 4. Substance classification

Arylcyclohexylamine

#### 5. Detection

Type: Collected sample

Fluorexetamine has also been identified in a postmortem sample (blood, urine and vitreous), in the US and reported in December 2022 by NMS Labs – Criminalistic Laboratory, the Center for Forensic Science Research & Education (CFSRE) and NPS Discovery [1]. Trifluoromethyl-U-47700 and etizolam were also identified in the postmortem sample [1].

#### 6. Chemistry and Analysis

Chemical classification: cyclohexylamine; arylcyclohexylamine

Fluorexetamine, also known as FXE and 3-fluoro-deschloro-*N*-ethylketamine, is structurally related to the dissociative anesthetic ketamine, differing due to the replacement of the chlorine in the 2-position on the phenyl ring with fluorine in the 3-position and replacement of methylamino with ethylamino.

Fluorexetamine and 2-fluoro-deschloro-*N*-ethylketamine, formally notified in July 2022, are positional isomers. The identification and discrimination of these isomers can pose analytical challenges due to the fact that these substances have the same molecular weight and similar fragmentation patterns, as a result other analysis techniques, in addition to GC-MS, such as FTIR or NMR may be required. Fluorexetamine also shares structural similarities with deoxymethoxetamine and hydroxetamine, formally notified in 2021.

Reference standards are available for the hydrochloride salts of fluorexetamine [2] and 2-fluoro-deschloro-*N*-ethylketamine [3]. The hydrochloride salt of fluorexetamine is soluble in DMF (5 mg/ml), DMSO (10 mg/ml), PBS (pH 7.2; 5 mg/ml) and ethanol (10 mg/ml) [2].

The positional isomers fluorexetamine and 2-fluoro-deschloro-*N*-ethylketamine have recently been shown in the scientific literature to exhibit similar EI-mass spectra and to distinguish between the two, the authors suggested using mass-to-charge ( $m/z$ ) value of 95 as a marker [3].

Fluorexetamine appears to have been discussed online and reportedly sold online since around 2017 [4,5].

Fluorexetamine contains a stereogenic centre and therefore two possible enantiomers may exist.

#### 7. Pharmacology and toxicology

Pharmacological classification: dissociative

There is no information available on the pharmacology and toxicology of fluorexetamine. Based on its chemical structure and on its similarity to ketamine, fluorexetamine is expected to have dissociative effects.

## 8. References

- [1] <https://www.cfsre.org/images/monographs/Fluorexetamine-121622-CFSRE-Toxicology-Report.pdf>
- [2] [https://www.caymanchem.com/product/35118/fluorexetamine-\(hydrochloride\)](https://www.caymanchem.com/product/35118/fluorexetamine-(hydrochloride))
- [3] [https://www.caymanchem.com/product/36722/2-fluoro-2-oxo-pce-\(hydrochloride\)](https://www.caymanchem.com/product/36722/2-fluoro-2-oxo-pce-(hydrochloride))
- [4] Wallach J, et al. 1, 2-Diarylethylamine-and ketamine-based new psychoactive substances. In New Psychoactive Substances 2018 (pp. 305-352). Springer, Cham.
- [5] [https://ndews.org/?wysija-page=1&controller=email&action=view&email\\_id=314&wysijap=subscriptions](https://ndews.org/?wysija-page=1&controller=email&action=view&email_id=314&wysijap=subscriptions)