

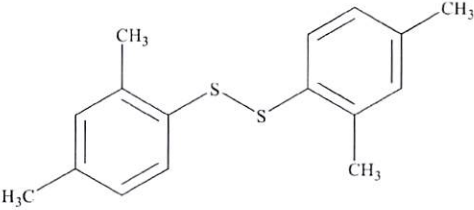
## Certificate of Analysis

Certificate No.: **20230906004**



Date: September 6, 2023

Retest date: September 5, 2026

|  |  |
|--|--|
| <b>Compound Name:</b> Vortioxetine Impurity 18 |  |
| <b>Synonyms:</b>                               | 1,2-bis(2,4-dimethylphenyl)disulfane           |
| <b>TLC Catalogue Number:</b>                   | V-043019                                       |
| <b>CAS Number:</b>                             | 13616-83-6                                     |
| <b>Molecular Weight:</b>                       | 274.44   |
| <b>Molecular Formula:</b>                      | C <sub>16</sub> H <sub>18</sub> S <sub>2</sub> |
| <b>Source:</b>                                 | TLC Pharmaceutical Standards                   |
| <b>Source Lot No.:</b>                         | 3413-022A3                                     |
| <b>Storage Conditions:</b>                     | Store at 2-8 °C                                |
| <b>Solubility:</b>                             | Methanol, DMSO, Acetonitrile                   |



| Test Description               | Specifications        | Results         |
|--------------------------------|-----------------------|-----------------|
| <b>Visual Description</b>      | Pale yellow liquid    | <b>Conforms</b> |
| <b>Identification</b>          |                       |                 |
| IR                             | Conforms to structure | <b>Conforms</b> |
| MS                             | Conforms to structure | <b>Conforms</b> |
| <sup>1</sup> H NMR             | Conforms to structure | <b>Conforms</b> |
| <b>Purity (HPLC)</b>           | Not less than 95.0%   | <b>99.9%</b>    |
| <b>Impurity (HPLC)</b>         | N/A                   |                 |
| <b>Water Content (KF)</b>      | N/A                   | <b>0.2%</b>     |
| <b>Residual Solvents (NMR)</b> | 0.4% <i>n</i> -hexane |                 |
| <b>Assay (%)</b>               | Not less than 90.0%   | <b>99.3%</b>    |
| <b>Recommendation:</b>         | <b>Release.</b>       |                 |

| Name                      | Department        | Signature  | Date       |
|---------------------------|-------------------|--|------------|
| Reviewed and approved by: | Quality Control   |  | 09/07/2023 |
| Approved by:              | Quality Assurance |  | 09/07/2023 |

**Attachments:** HPLC, IR, MS and NMR spectra.