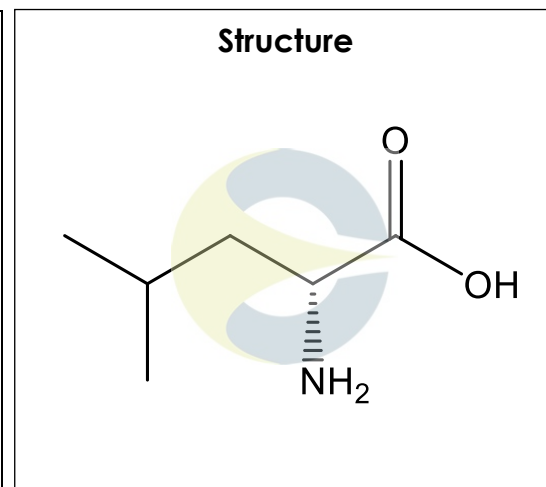


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|                              |                               |
|------------------------------|-------------------------------|
| <b>PRODUCT NAME</b>          | L-Leucine                     |
| <b>PART NUMBER</b>           | 00012126                      |
| <b>STANDARD TYPE</b>         | Primary (P)                   |
| <b>LOT NUMBER</b>            | 00012126-15V                  |
| <b>REPORT NUMBER</b>         | CDXA-RSS-6300-01              |
| <b>SAMPLE NUMBER</b>         | CDXA-14-6322                  |
| <b>DATE OF SAMPLE</b>        | 10/10/2014                    |
| <b>DATE OF RE-EVALUATION</b> | 01/29/2019 (1 <sup>st</sup> ) |
| <b>DATE OF REPORT</b>        | 02/22/2019                    |



|                              |  |
|------------------------------|--|
| <b>CHEMICAL NAMES</b>        | (2S)-2-Amino-4-methylpentanoic acid; (S)-Leucine; L- $\alpha$ -Aminoisocaproic acid; Leucine |
| <b>CHEMICAL FORMULA</b>      | C <sub>6</sub> H <sub>13</sub> NO <sub>2</sub>   |
| <b>MOLECULAR WEIGHT (MW)</b> | 131.17   |
| <b>CHEMICAL FAMILY</b>       | Amino acids  |
| <b>CAS NUMBER</b>            | [61-90-5]  |
| <b>EC#(EINECS)</b>           | 200-522-0  |
| <b>RTECS</b>                 | OH2850000  |

**ANALYTICAL RESULTS**

| TEST             | METHOD                   | SPECIFICATION         | RESULT   |
|------------------|--------------------------|-----------------------|--|
| Adjusted Purity  | NA                       | NA                    | 99.4%  |
| HPLC             | CDXA-CPM-101-00          | NA                    | 99.9%  |
| NMR              | 99.1-CD-1.0-000122       | Conforms to structure | Conforms to structure  |
| Mass Spectrum    | Direct Infusion, ESI (+) | Conforms              | Conforms   |
| Residual Solvent | 99.1-CD-7.0-000115       | NA                    | Isopropyl acetate – 0.3%;<br>Nitromethane – 0.1%;<br>Pyridine – 0.1% |
| Water            | 99.1-04-10.0-000094      | NA                    | ND   |
| Appearance       | NA                       | NA                    | White powder   |

ADJUSTED PURITY: 99.4% IS BASED ON (100 - 0.5 SOLVENTS - 0.0 WATER) X 99.9% HPLC

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### STORAGE CONDITIONS

|                        |                                     |
|------------------------|-------------------------------------|
| <b>STORAGE</b>         | Room Temperature in a dry place.    |
| <b>EXPIRATION DATE</b> | 01/2024 under the above conditions. |

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Email: [customerservice@lifetechindia.com](mailto:customerservice@lifetechindia.com) Website: [www.lifetechindia.com](http://www.lifetechindia.com)

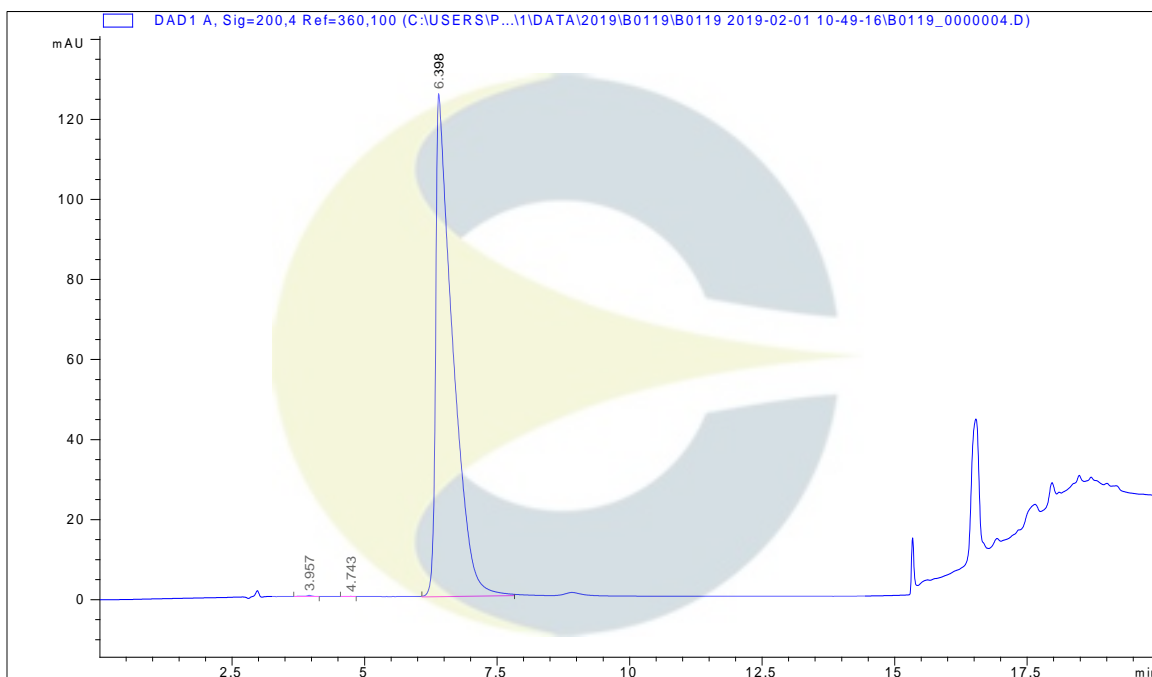
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### ANALYTICAL CONDITIONS

|                        |   |
|------------------------|---|
| <b>INSTRUMENT</b>      | AGILENT 1260 HPLC UV-VIS (DAD); AGILENT 6510 QTOF   |
| <b>COLUMN</b>          | Phenomenex Synergi Hydro 250 x 4.6 mm, 4 µm particle size   |
| <b>MOBILE PHASE</b>    | A – 10 mM monobasic Potassium phosphate in Ultrapure water (pH – 2.9),<br>B – Acetonitrile;<br>Isocratic 0% B for 10 minutes, increase to 40% B over 5 minutes, hold at 40% B for 4.9 minutes. Return to 0% B over 0.1 minutes. |
| <b>COLUMN TEMP.</b>    | 22 °C   |
| <b>FLOW RATE</b>       | 1.0 mL/minute   |
| <b>INJECTION VOL.</b>  | 10.0 µL   |
| <b>INJECTION CONC.</b> | 4.7 mg/mL in Ultrapure Water  |
| <b>DETECTION</b>       | 200 ± 4 nm  |

### HPLC CHROMATOGRAM OF L-LEUCINE (CDXA-14-6322)

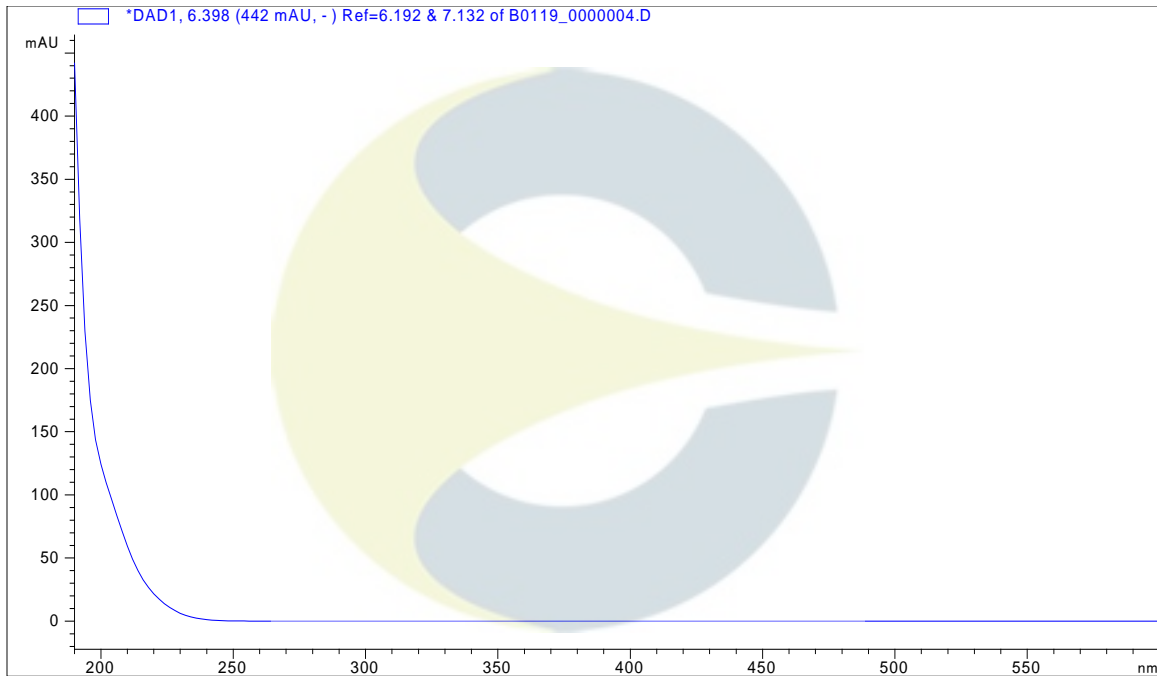


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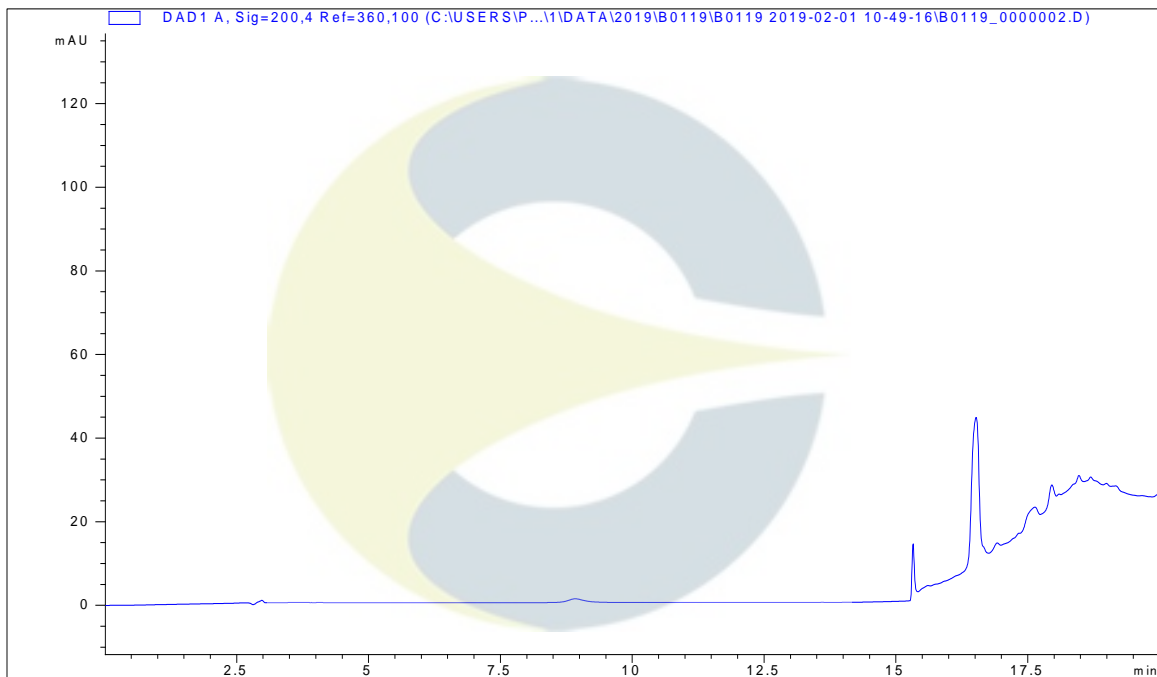
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## UV SPECTRUM AT RT = 6.4 MINUTES



## HPLC CHROMATOGRAM OF DILUENT BLANK

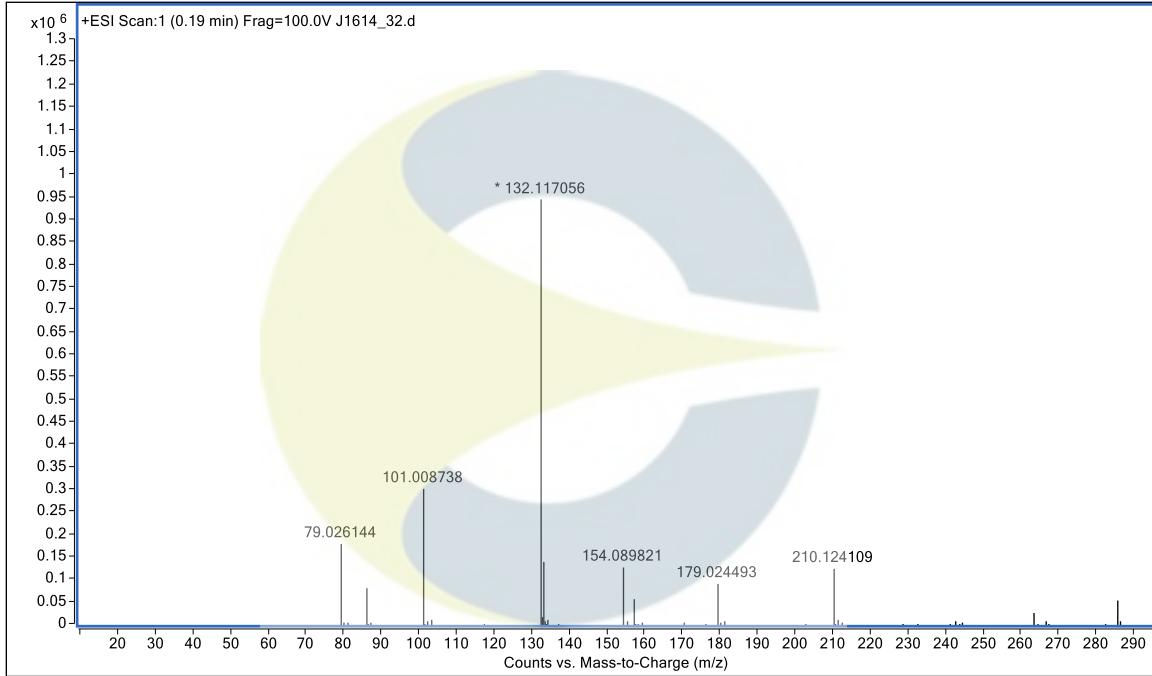


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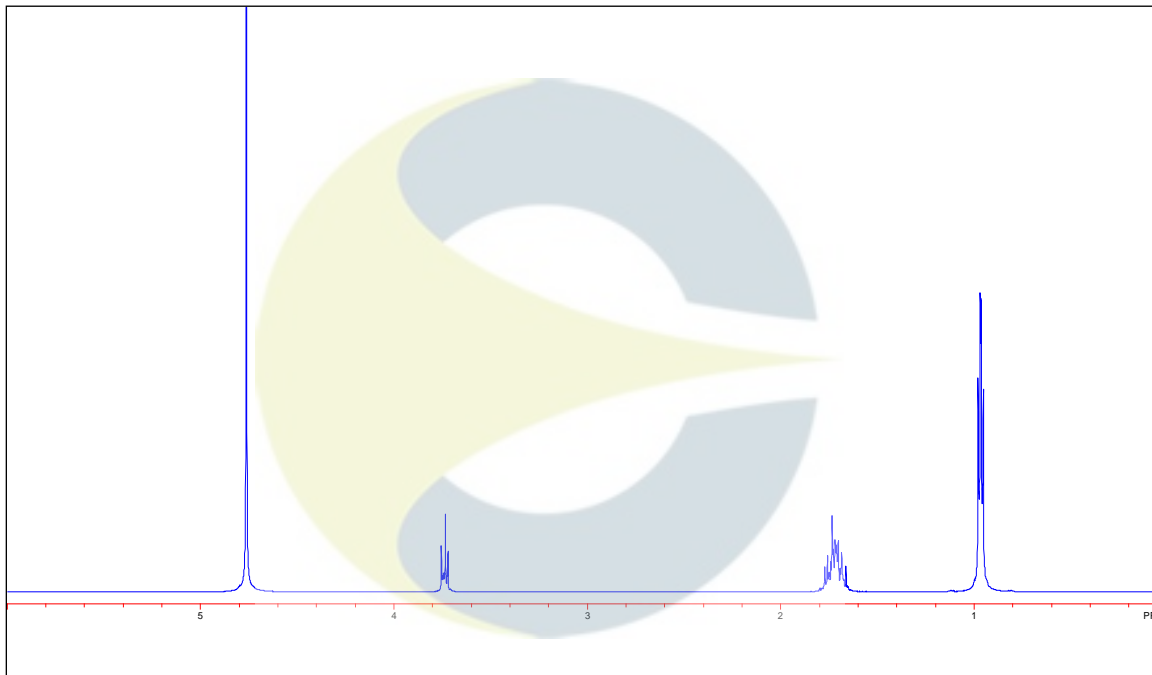
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**MASS SPECTRUM OF L-LEUCINE (CDXA-14-6322)**

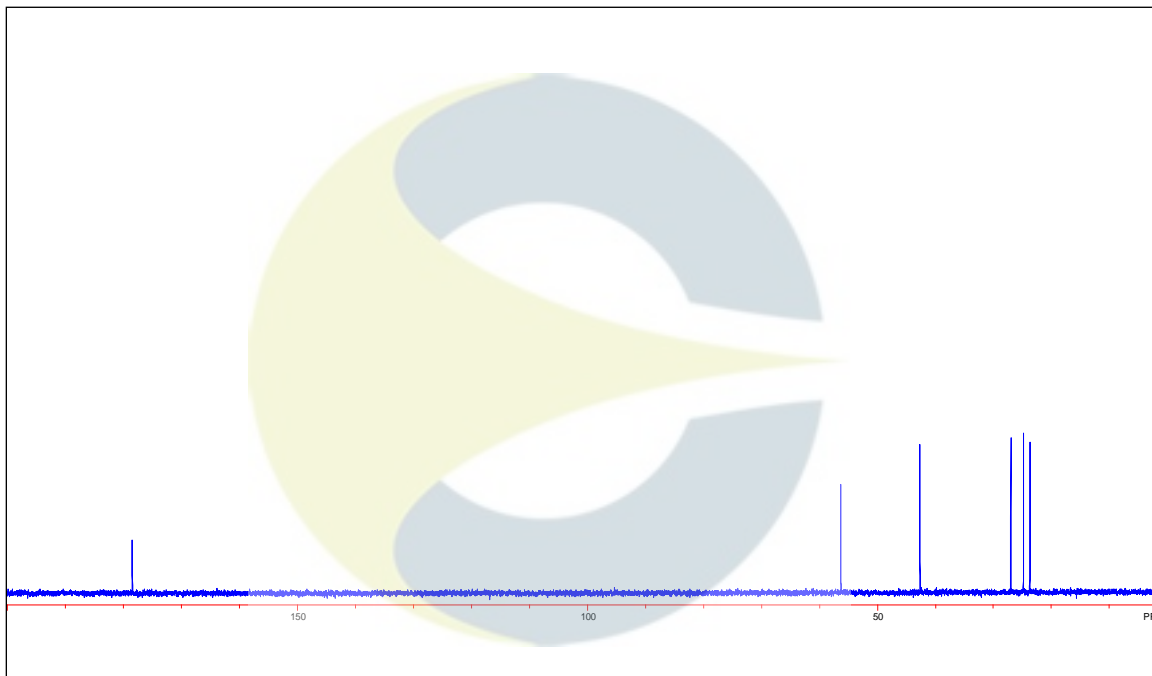


**<sup>1</sup>H-NMR SPECTRUM OF L-LEUCINE (CDXA-14-6322) IN D<sub>2</sub>O**

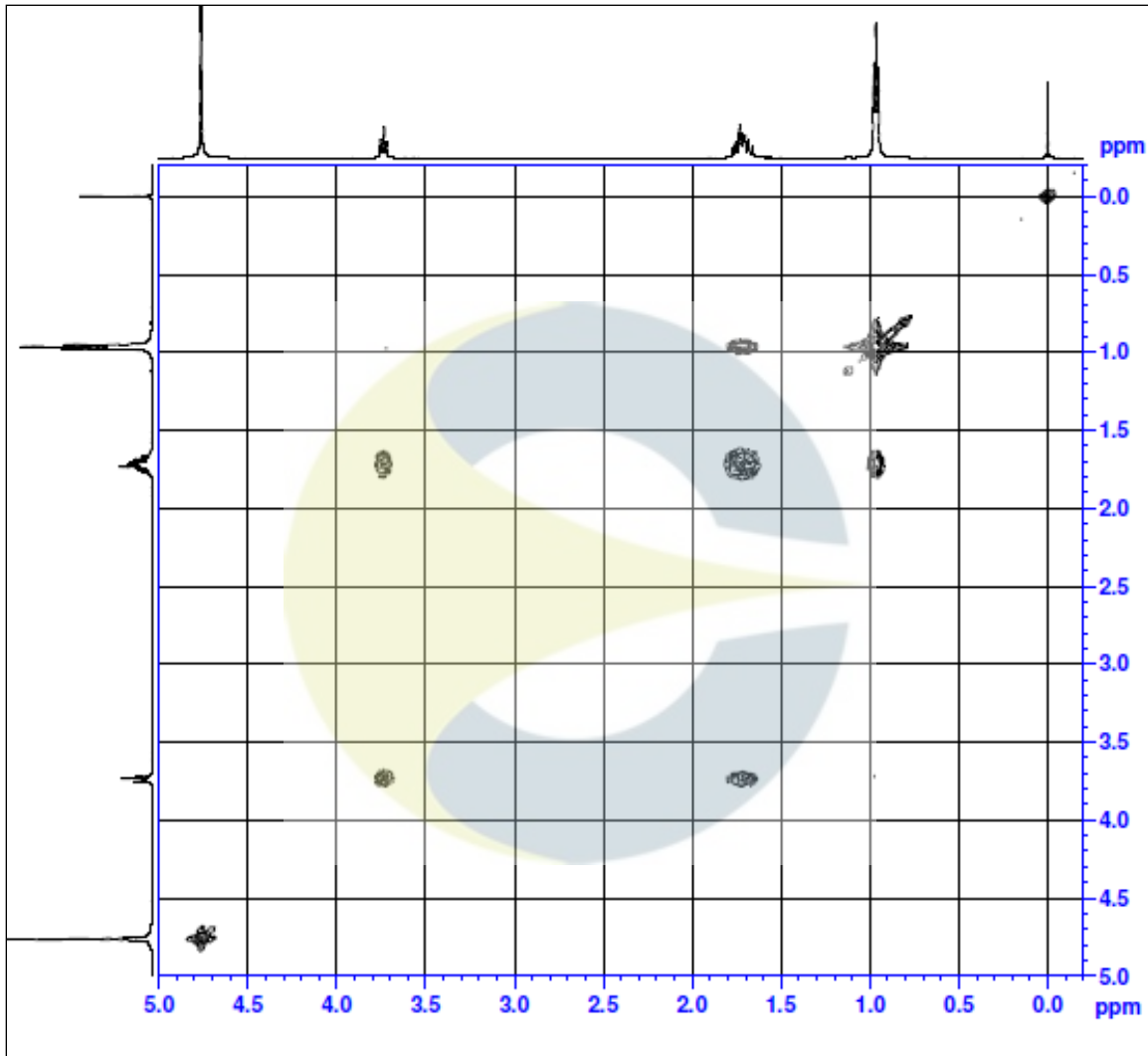


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**<sup>13</sup>C-NMR SPECTRUM OF L-LEUCINE (CDXA-14-6322) IN D<sub>2</sub>O**



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**COSY-NMR SPECTRUM OF L-LEUCINE (CDXA-14-6322) IN D<sub>2</sub>O**

**REVISION HISTORY**

| <u>Revision History</u> | <u>Date of Revision</u> | <u>Document/Changes</u>  |
|-------------------------|-------------------------|--|
| 00                      | 11/18/2014              | New report   |
| 01                      | 02/22/2019              | Passed second re-evaluation by HPLC and KF. Updated analytical conditions, chromatograms, results, and expiration date. Removed melting point. |

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