A dilute and shoot method for simultaneous determination of nicotine and 7 related impurities in e-liquid formulations by UPLC-UV-MS has been developed for routine QC testing of e-liquids and e-cigarette products.

E-liquid manufacturing standards are currently being established by regulatory agencies [1]. American E-liquid Manufacturing Standards Association (AEMSA) recommends using USP or certified nicotine with purity greater than or equal to 99%, with nicotine-N-oxide less than or equal to 1% and total contaminants less than or equal to 1% [2].

Simultaneous determination of nicotine and related impurities in e-liquids was achieved using a 7 minute UPLC separation coupled to UV and MS detections. A wide linear dynamic range for nicotine (2.5-500 µg/mL) using PDA detector and for related impurities (0.005-0.5 µg/mL) using MS detector was applied. Six different commercially available e-liquids and e-cigarette cartridges were analyzed following a 100-fold dilution to eliminate the need for multiple methods and analyses.

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