Greener and Whiter Analytical Method Development and Validation of Zolpidem Tartrate Infused in Apple Juice using RP-HPLC via Magnetic Solid Phase Extraction followed by LC-MS confirmatory analysis

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Supplementary data

Preparation of 0.25 mg/ml ZT stock solution

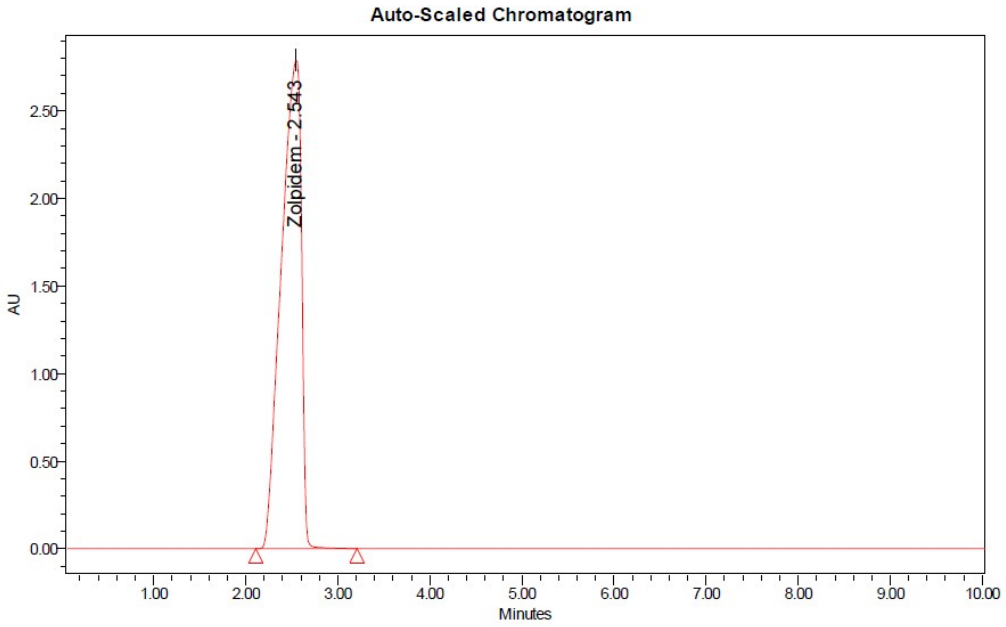
It was prepared by weighing 6.25 mg Active Pharmaceutical Ingredients (API) of ZT and transferred into 25ml standard solution. The drug was filled to the mark of standard flask using distilled water

Preparation of 100µg/ml standard solution.

100µg/ml standard solution was prepared by weighing 10mg of ZT API and transferring into 100ml standard flask. The flask was made to the mark using methanol.

Optimization of different parameters

Figure S1: Zolpidem API standard chromatogram



Characterization

Table S2: FTIR characterization of Fe_3O_4, SiO_2@Fe_3O_4, APTES@Fe_3O_4, PEI@SiO_2@Fe_3O_4 NPs

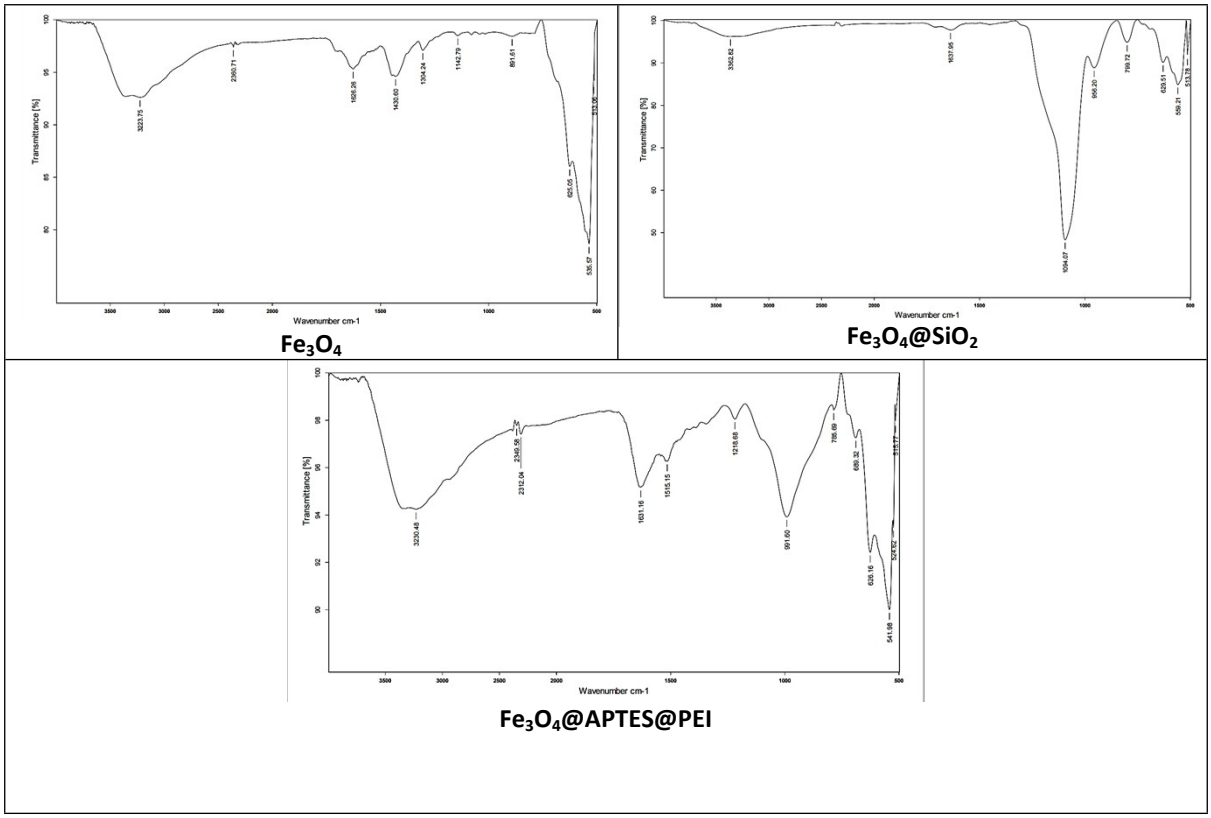
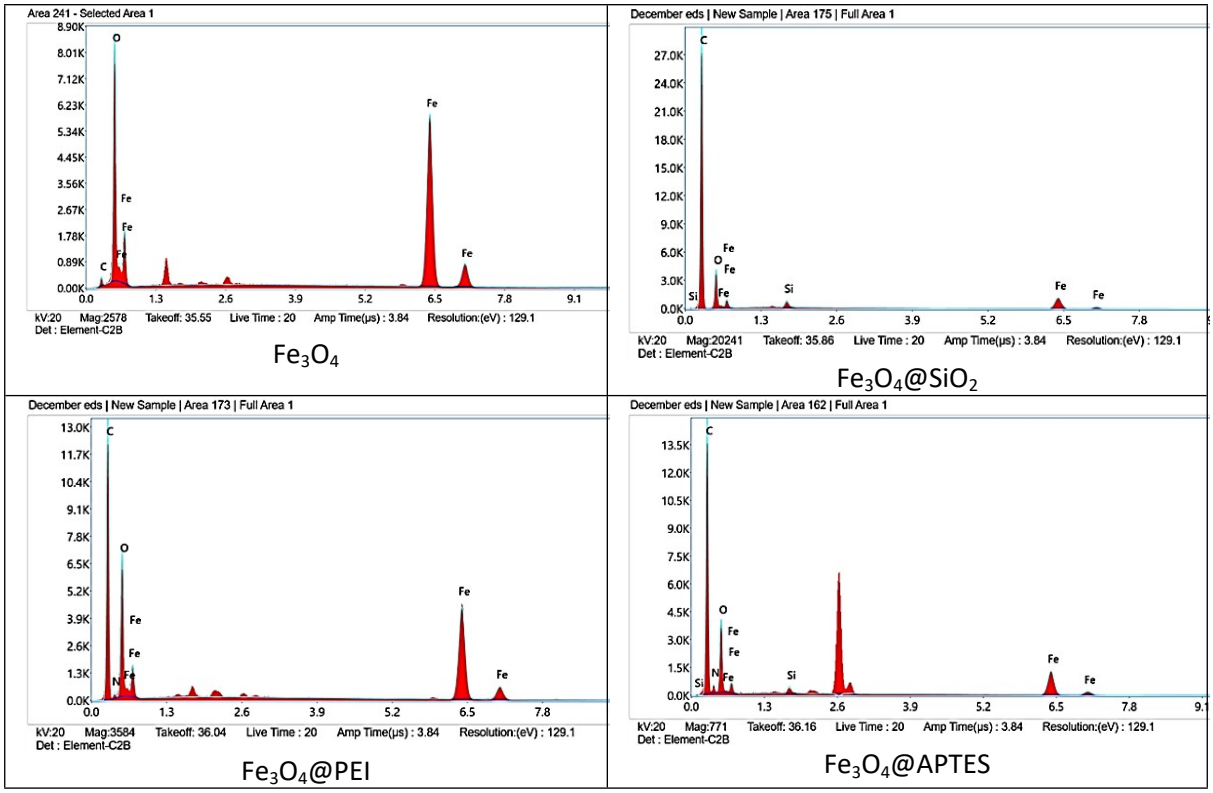


Table S3: SEM-EDX of Fe_3O_4, $SiO_2@Fe_3O_4$, $APTES@Fe_3O_4$, $PEI@SiO_2@Fe_3O_4$ NPs



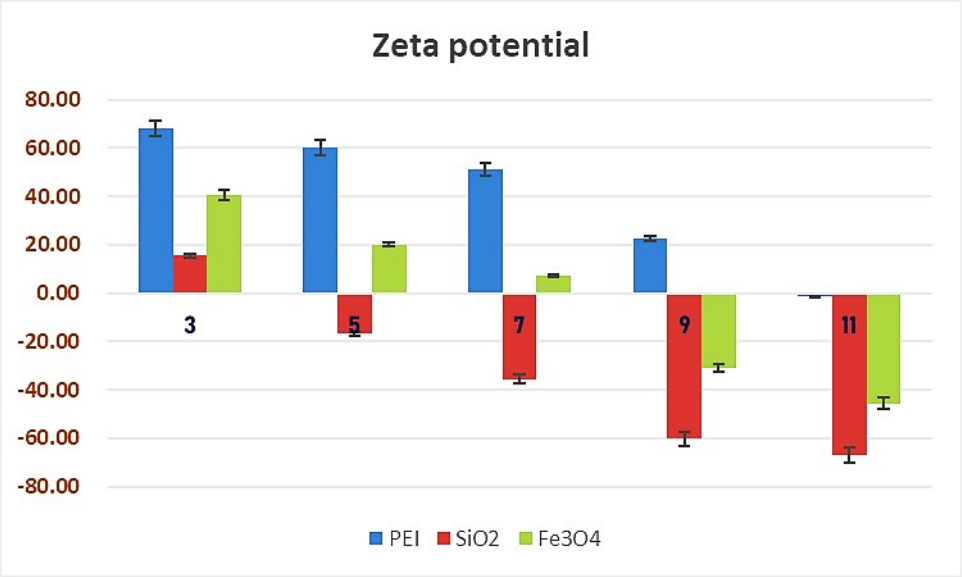
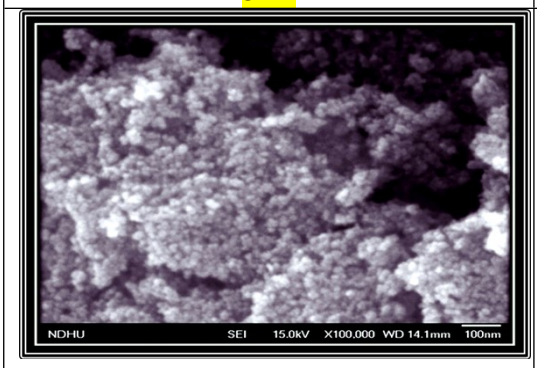
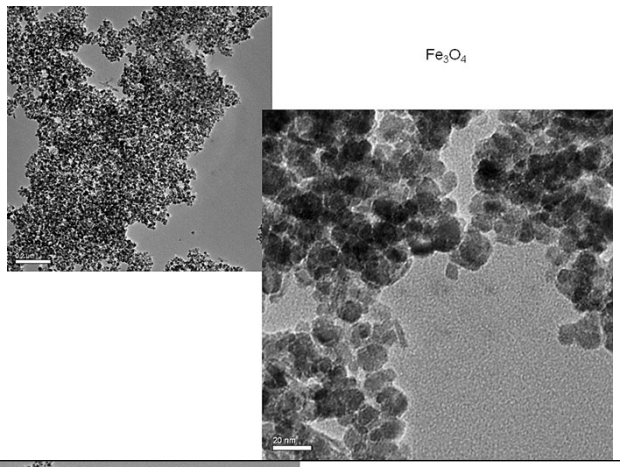
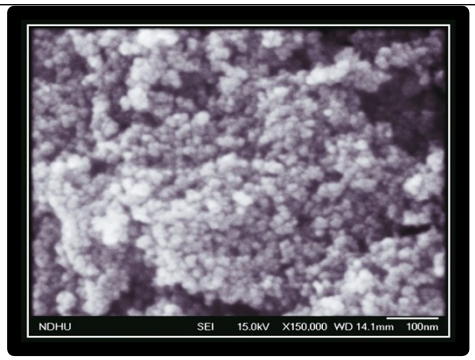
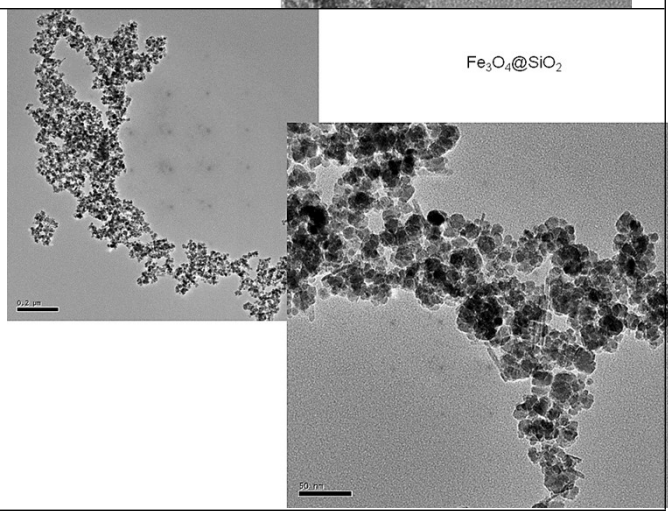
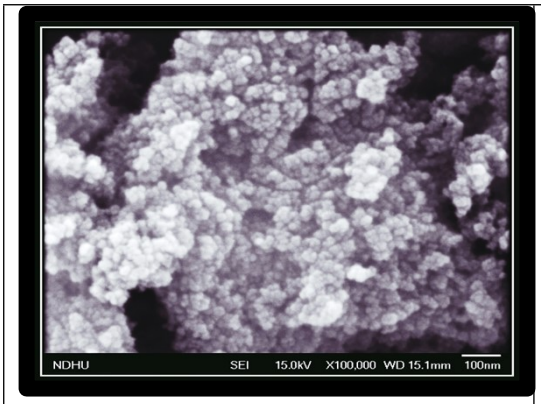


Figure S1: Zeta potential of Fe_3O_4, SiO_2@Fe_3O_4, APTES@Fe_3O_4, PEI@SiO_2@Fe_3O_4 NPs

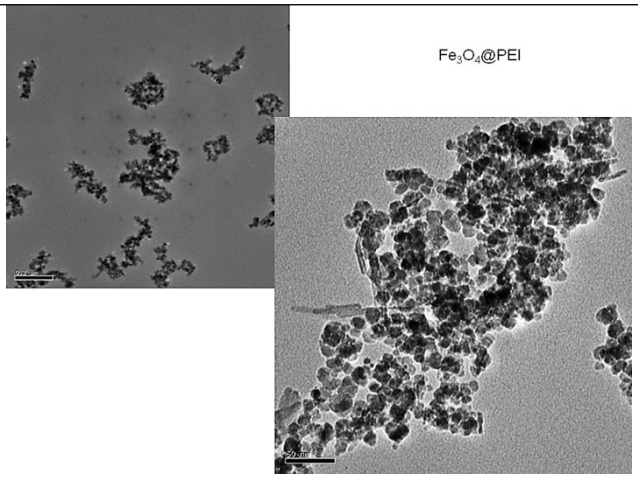
Morphological characterization

Table S4. SEM and TEM images of Fe_3O_4, Fe_3O_4@SiO_2 NPs, Fe_3O_4@SiO_2@PEI NPs

SEM	TEM
 Fe_3O_4 NPs	
 Fe_3O_4@SiO_2 NPs	



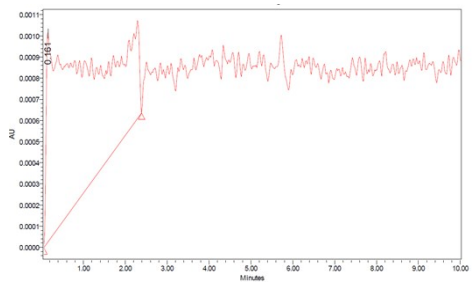
Fe_3O_4@SiO_2@PEI NPs



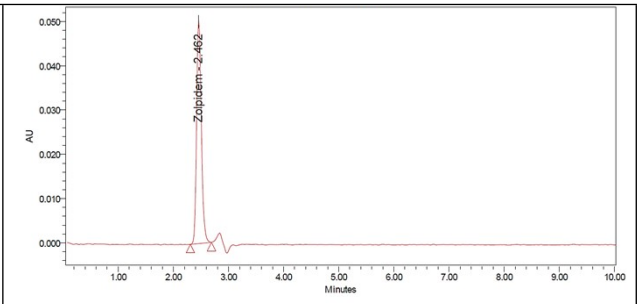
Fe_3O_4@SiO_2@PEI NPs

Method Validation

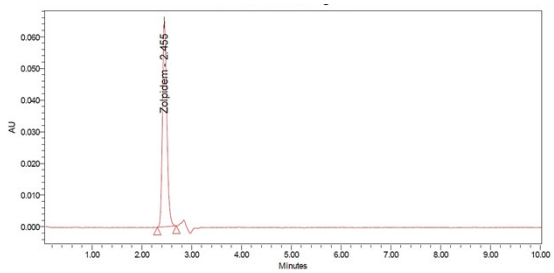
Table S5: Zolpidem tablet Standard Linearity Chromatograms from 6 to 14 ppm



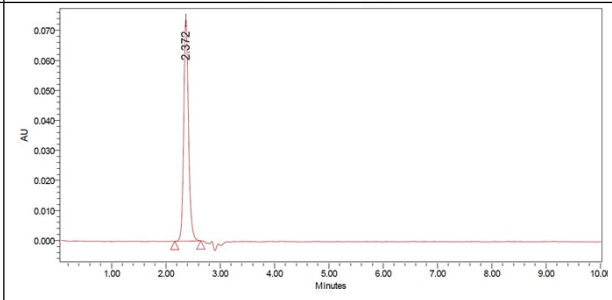
Blank



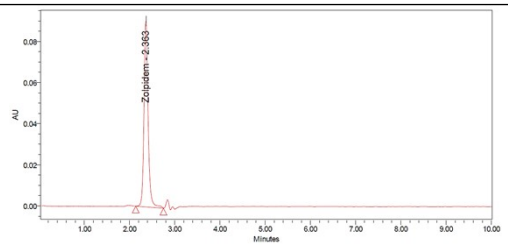
6PPM



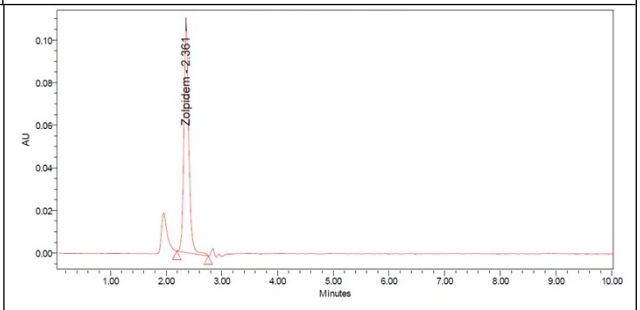
8PPM



10 PPM



12 PPM



14 PPM

Table S6: Zolpidem extraction linearity Chromatograms from 6 to 14 ppm

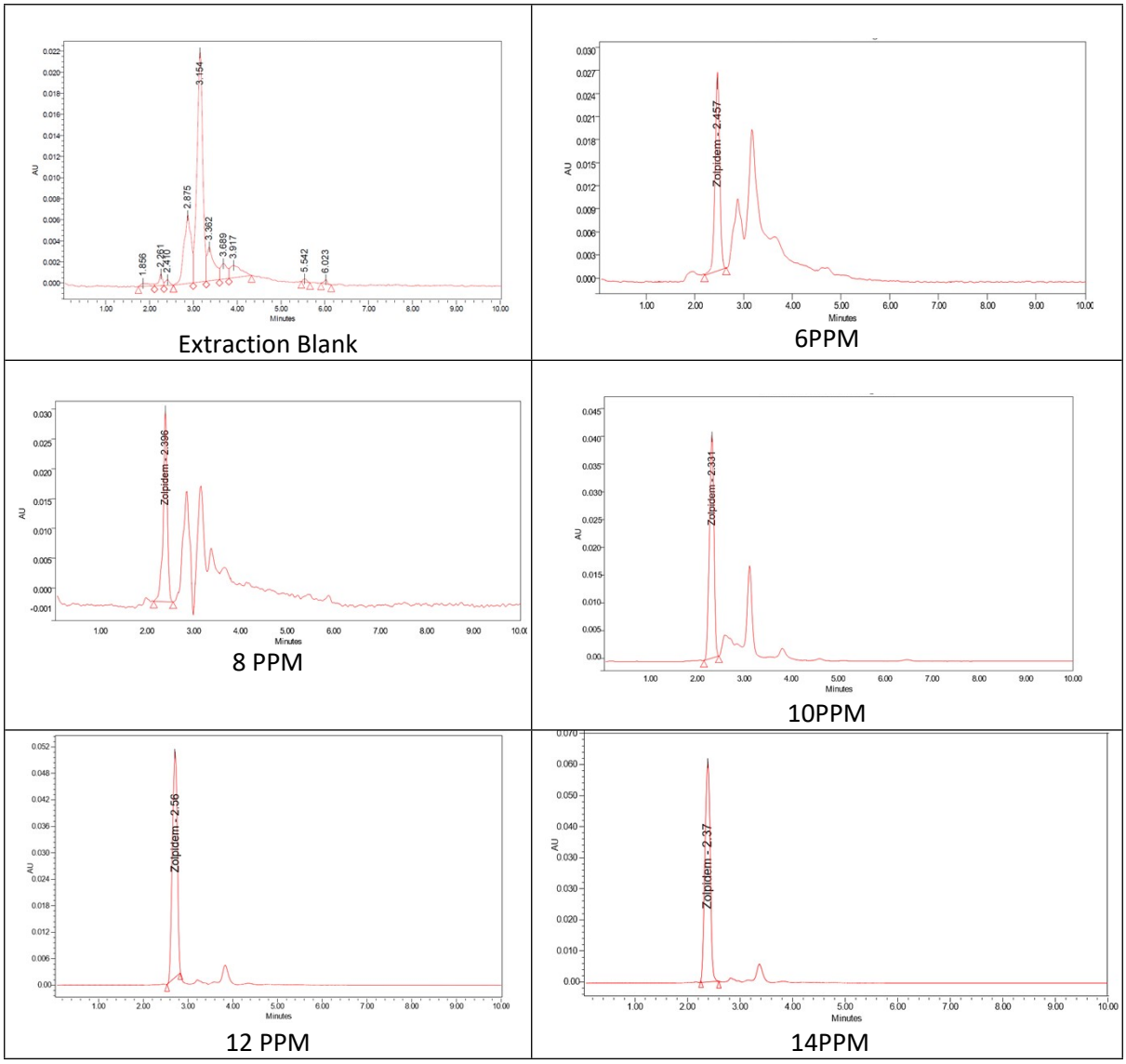


Table S7 Chromatograms of LOD and LOQ

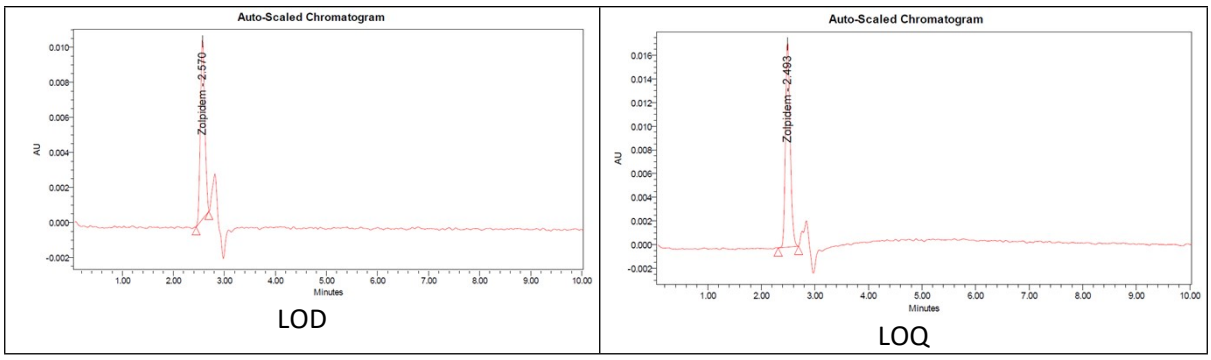
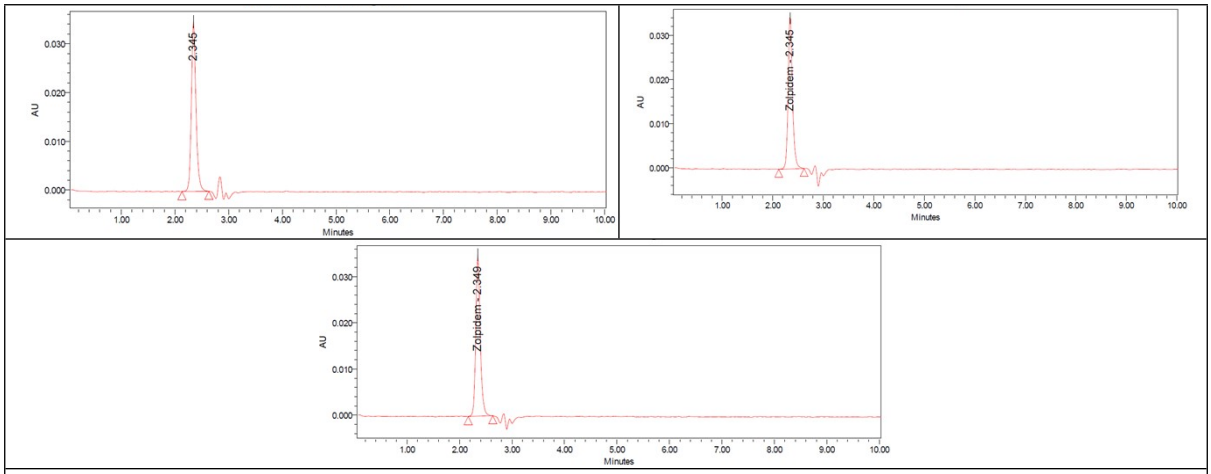
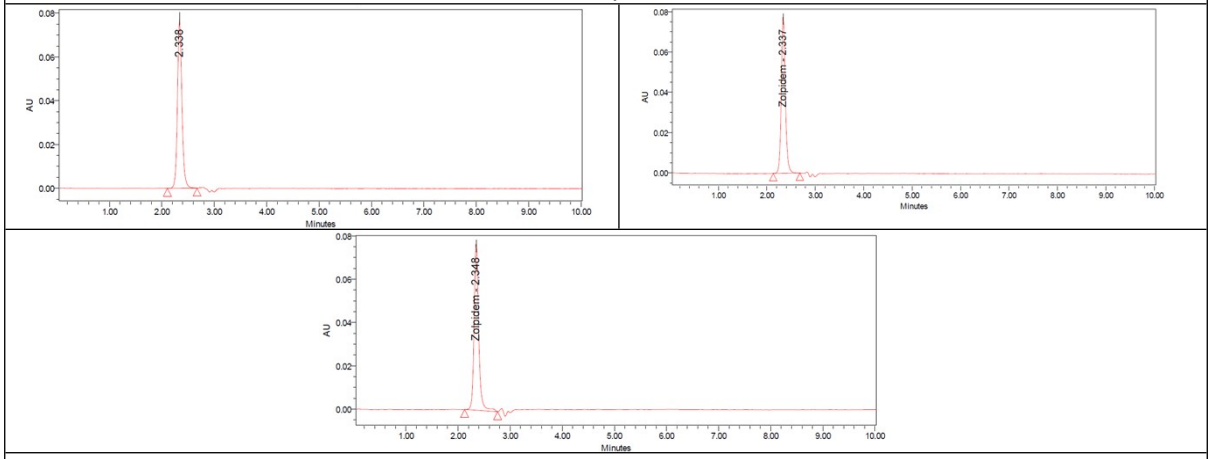


Table S8: Accuracy chromatograms

Accuracy 50%



Accuracy 100%



Accuracy 150%

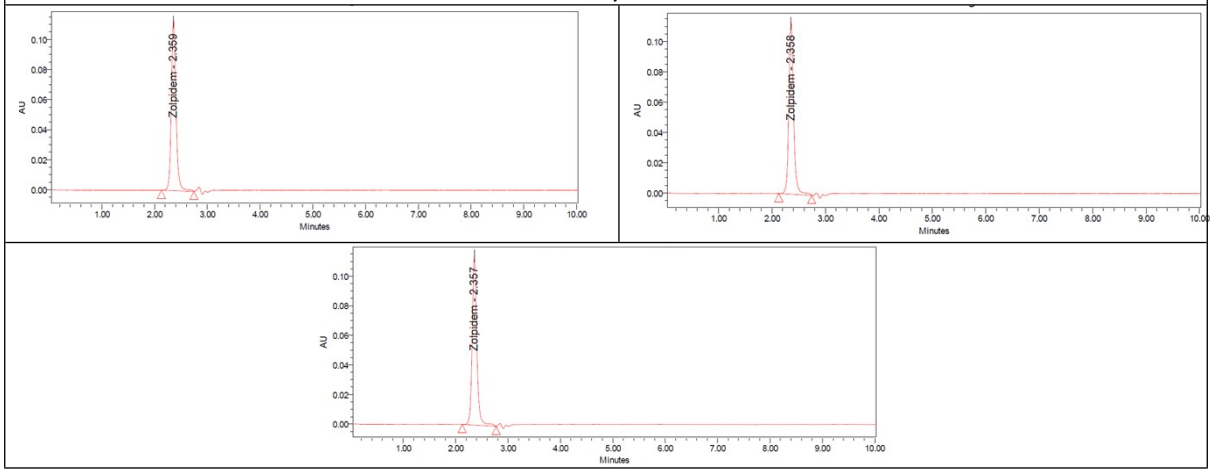
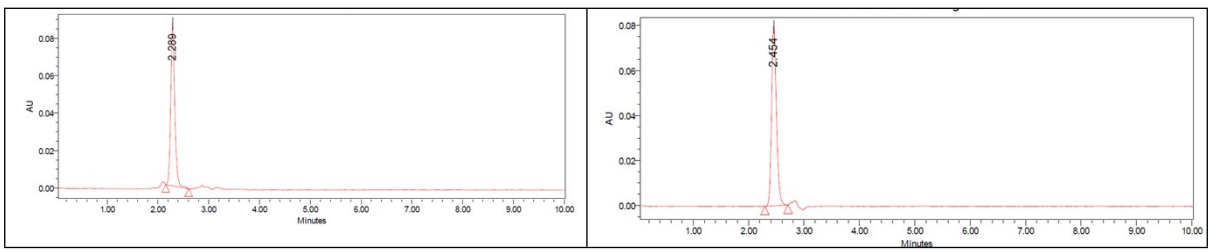


Table S9: Precision for chromatograms



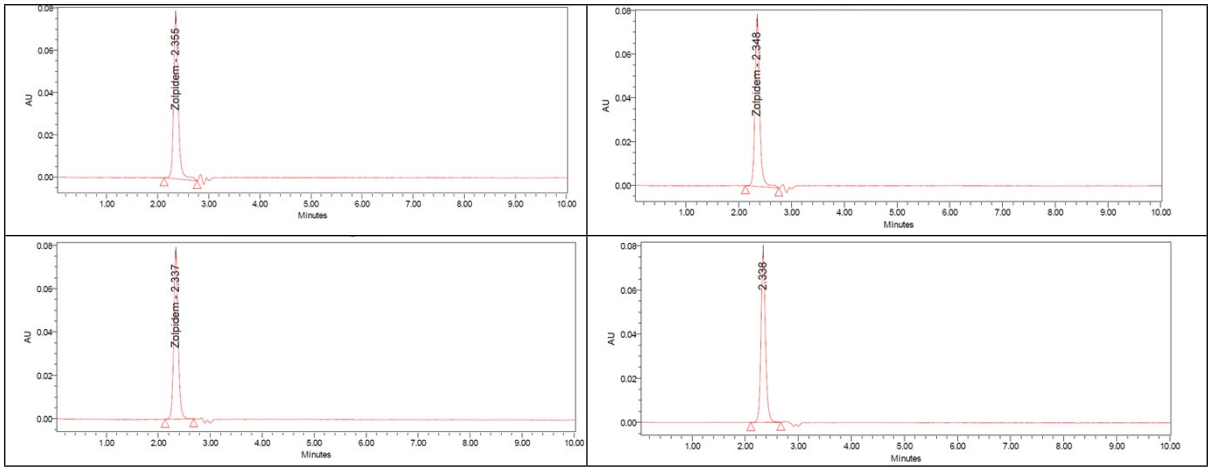
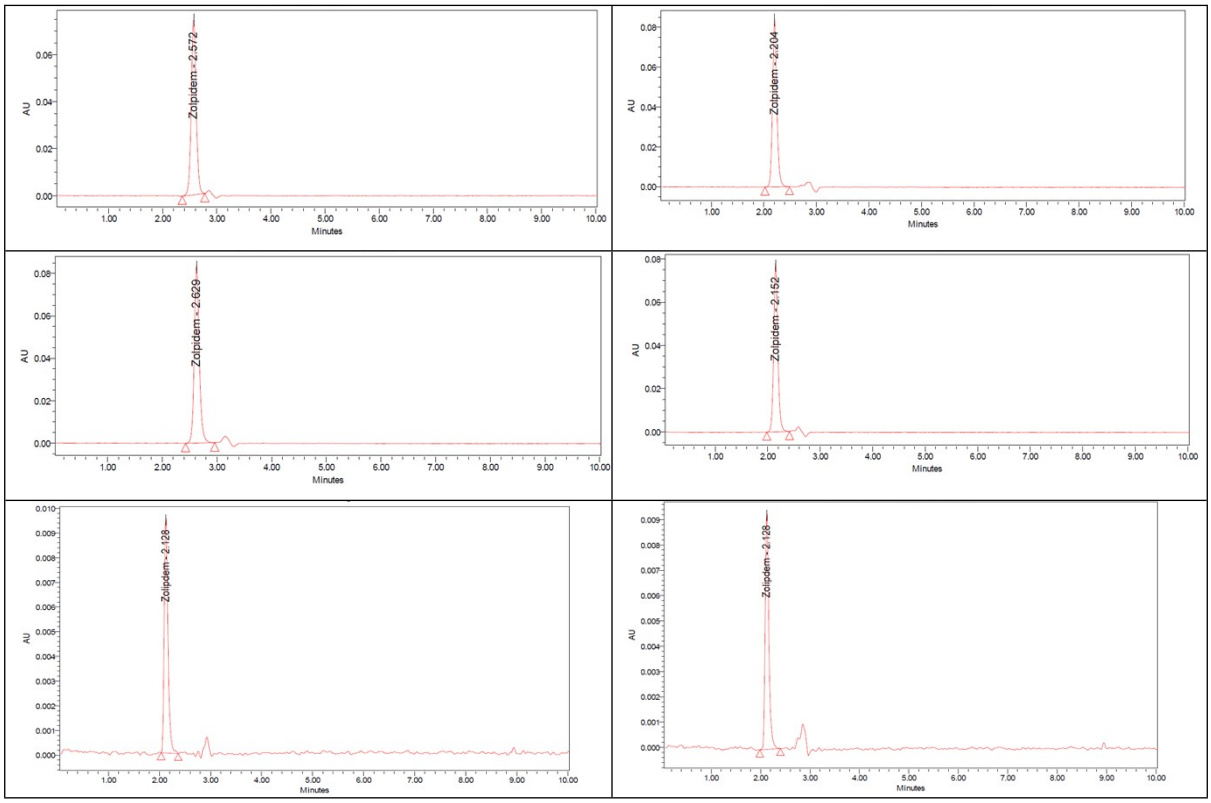


Table S10: Robustness chromatograms



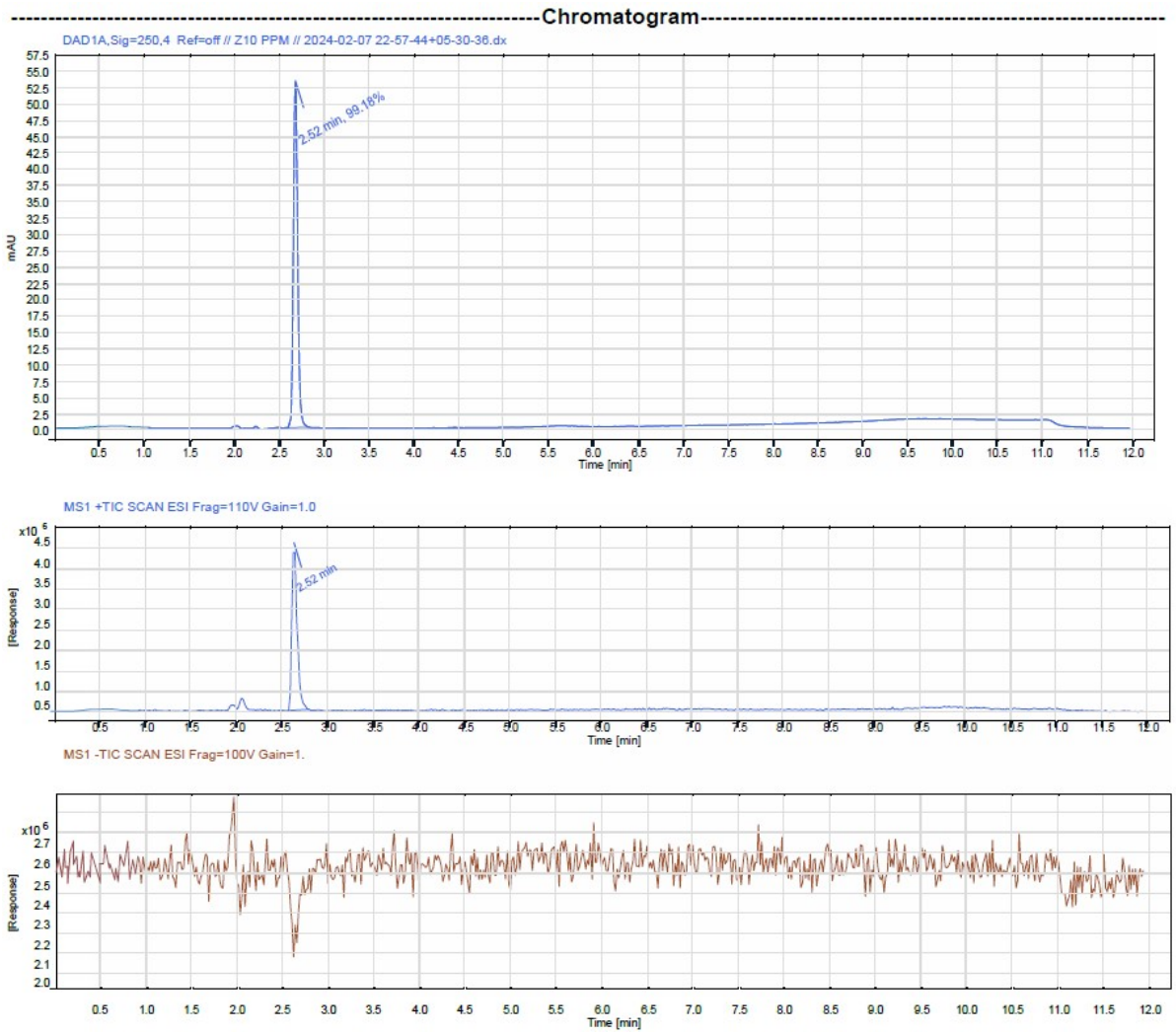


Figure S2: Zolpidem Standard LC-MS chromatogram

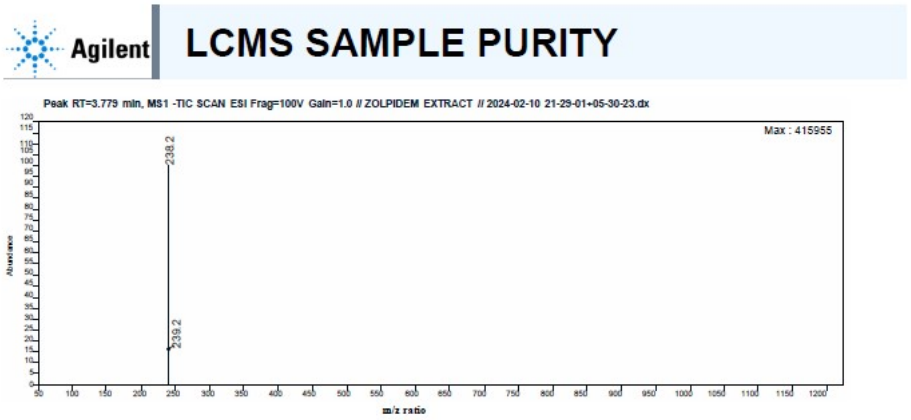


Figure S3: Zolpidem Standard Mass Spectrum

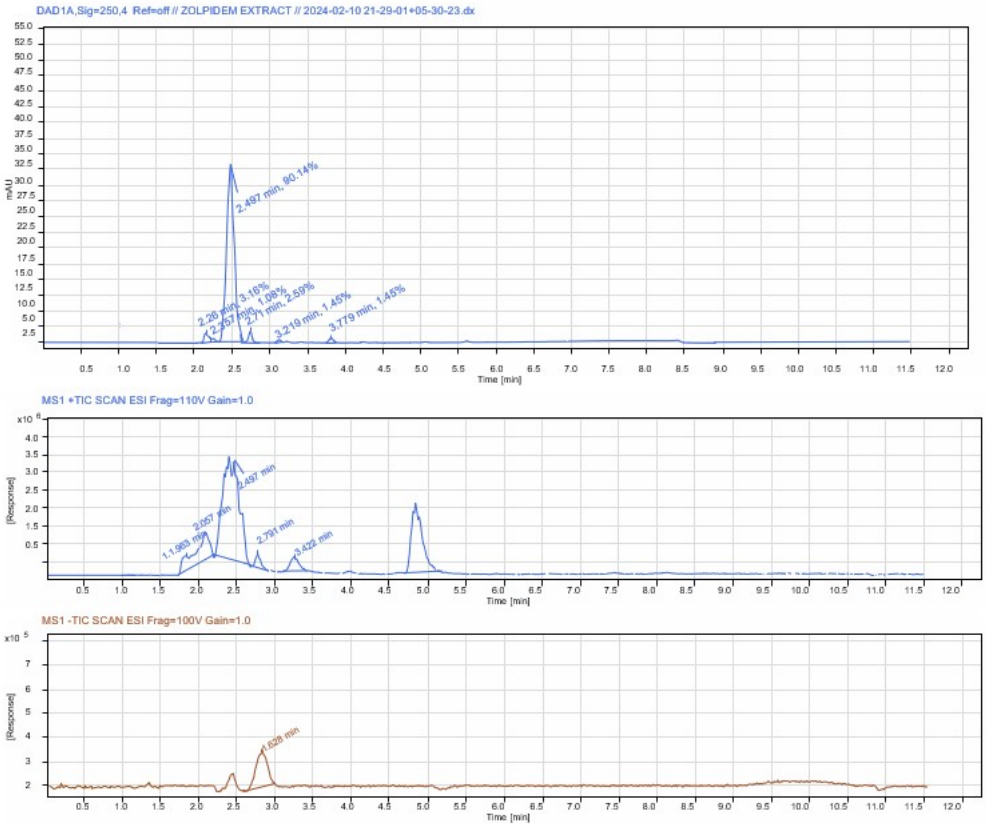


Figure S4: Zolpidem Extract from Apple juice matrix LC-MS chromatogram

Agilent **LCMS SAMPLE PURITY**

RT [min]	Area	Height	Area%
2.263	74.2797	2.7208	3.1589
2.357	25.4187	1.3207	1.0810
2.497	1119.6759	32.5345	90.1423
2.719	60.8122	2.6228	2.5861
3.219	15.3546	0.8394	0.6530
3.766	7.7700	1.3217	0.3304
3.072	3.5885	0.6783	0.1526
3.779	34.1311	1.9240	1.4515
4.405	5.7159	0.2578	0.2431
5.745	4.7311	0.1693	0.2012

MS Spectrum

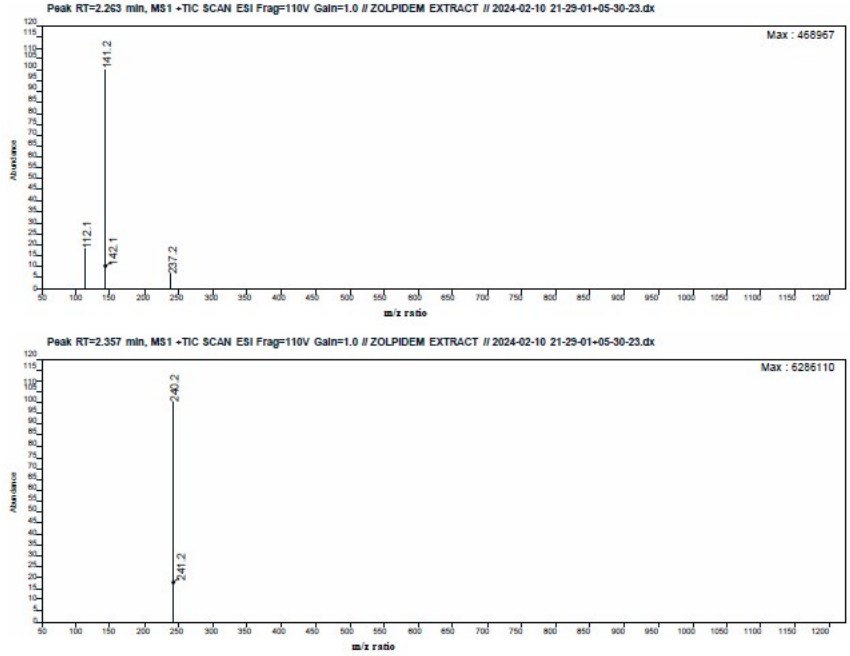


Figure S5: Matrix Mass Spectrum

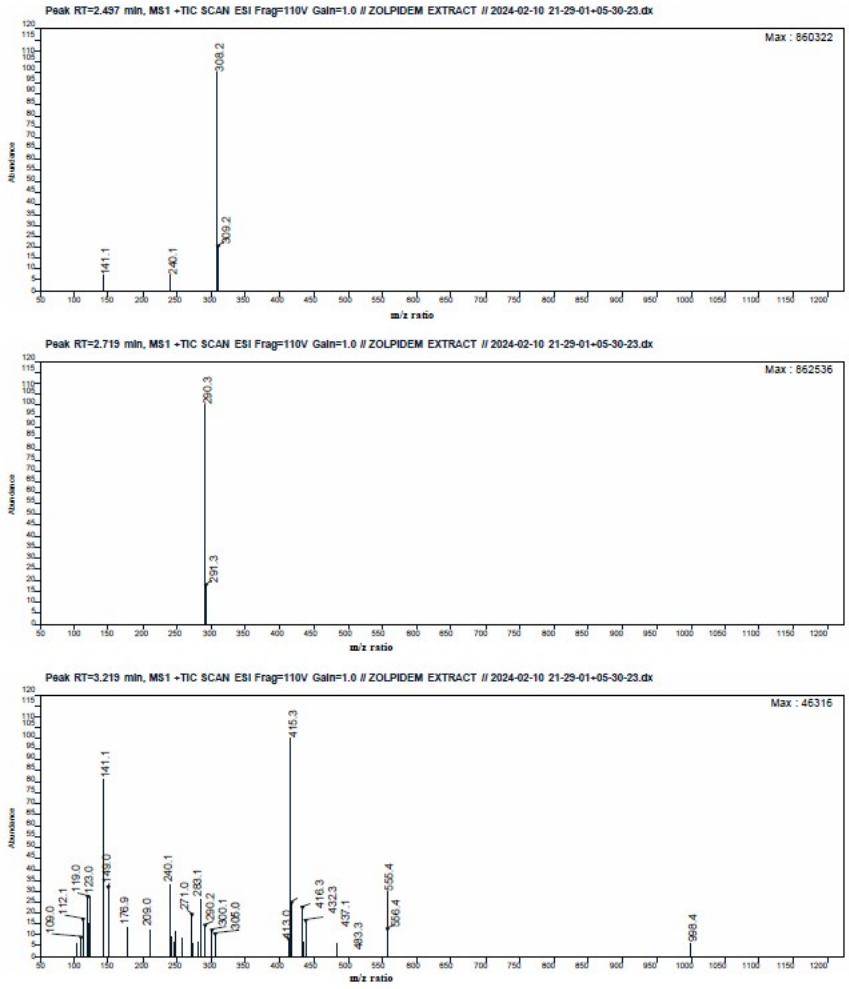
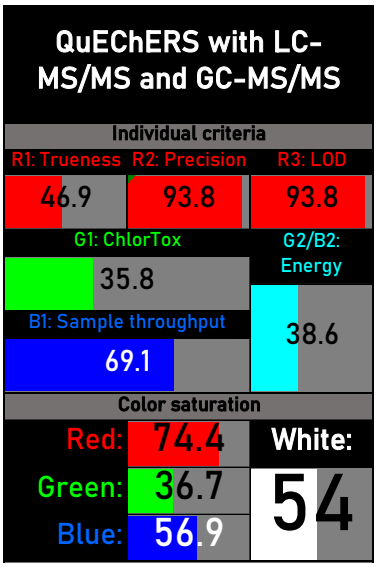
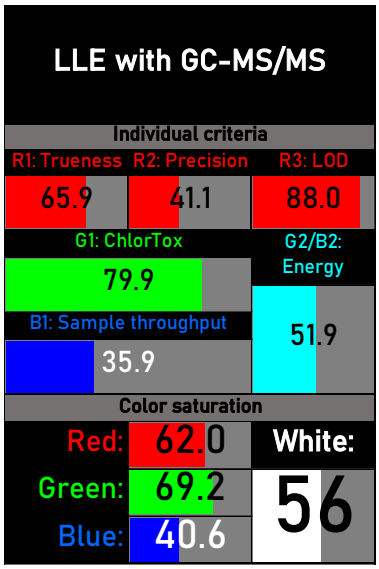


Figure S6: Zolpidem and Matrix Mass Spectrum

RGBfast



a



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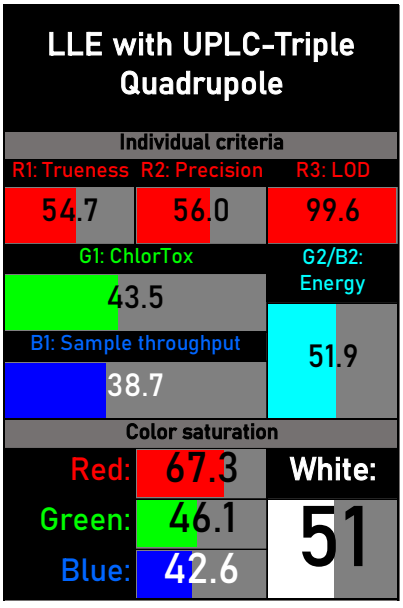

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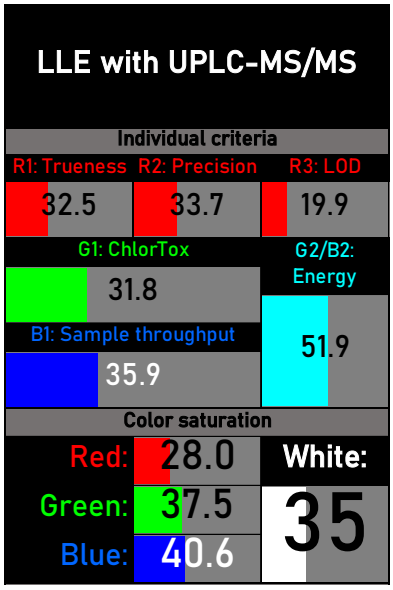

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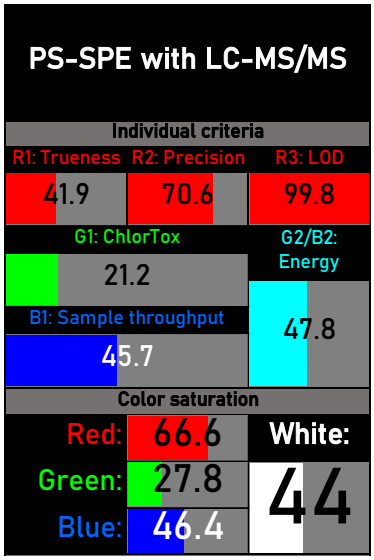

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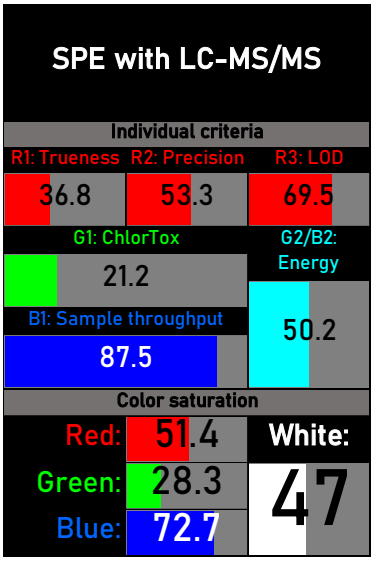

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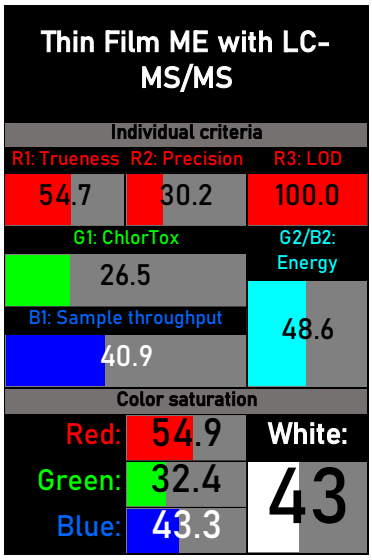

g

Figure S7: Comparative study of previous similar methods with detailed RGBfast