Attention-deficit/hyperactivity disorder (ADHD) is a neurological disorder that arises from a lack of dopamine in the brain. The dopamine deficiency leads to inability to pay attention, lack of focus and boredom. Medications work to combat this disorder by blocking dopamine reuptake transporters thus increasing dopamine and speeding up brain activity. One of the main medications prescribed to treat ADHD is methylphenidate. Methylphenidate has two chiral centers which gives rise to four stereoisomers that effect the brain in different ways. Due to the differing effects of the enantiomers, it is important to separate the enantiomers to better understand the pharmacodynamic and pharmacokinetics (PD/PK) of these medications. Methylphenidate is metabolized to ritalinic acid and, in the presence of ethanol, can break down to ethylphenidate. There are minimal comprehensive methods that separate the enantiomers of methylphenidate and its metabolites. To bridge the gap in knowledge, this study aims to analyze these cognitive stimulants in traditional and alternative toxicological matrices across multiple analytical platforms. Additionally, stability of these analytes needs to be assessed to better understand proper handling conditions of forensic toxicology specimens.