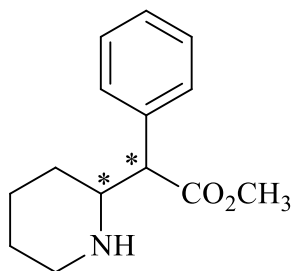
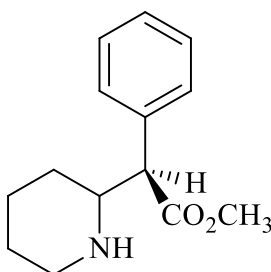


- Methylphenidate, also known as Ritalin, is a psychostimulant drug approved for the treatment of attention-deficit disorder. Identify all stereogenic (chiral) centres in methylphenidate by clearly marking each with an asterisk (\*) on the structure below.

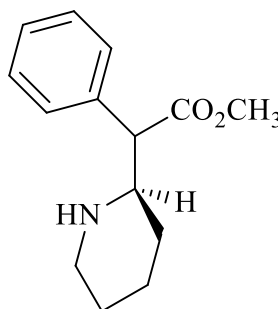
methylphenidate



Using one stereogenic centre you have identified, draw the (*R*)-configuration of that centre.



or



How many stereoisomers are there of methylphenidate? Describe the relationships between these isomers.

**4 isomers: there are 2 pairs of enantiomers:  
Each isomer has 1 enantiomer and 2 diastereoisomers**

Give the products formed when methylphenidate is hydrolysed with 4 M HCl.

