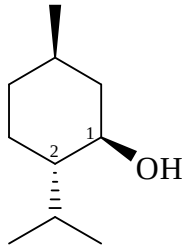
Marks 10

- The following questions pertain to the terpene natural product menthol (**J**), whose structure is shown. Carbons 1 and 2 are numbered to help you construct your answer.

J

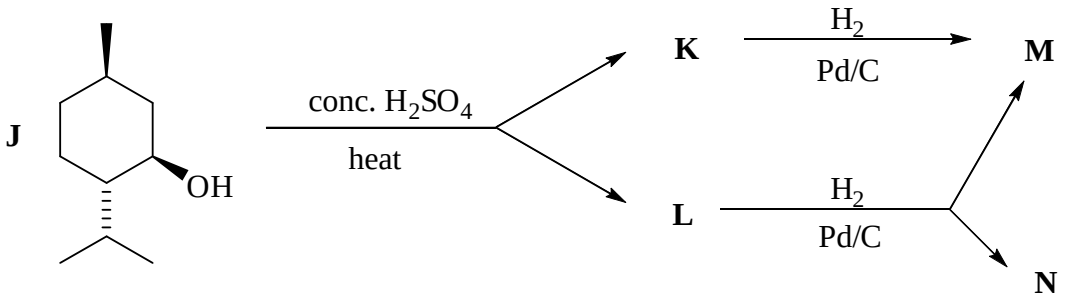


Ignoring the stereochemistry, what is the systematic name for menthol?

Assign the absolute configuration at C1 and at C2. Explain your reasoning.

C1	C2

When menthol (**J**) is heated with concentrated sulfuric acid, two isomeric products **K** and **L** are formed. When **K** and **L** are treated with excess H_2 in the presence of a Pd/C catalyst, two products **M** and **N** are observed: **K** gives only **M**, while **L** gives a mixture of **M** and **N**. Propose structures for **K**, **L**, **M** and **N**.



K	**L**	**M**	**N**

What is the isomeric relationship between **K** and **L**?

What is the isomeric relationship between **M** and **N**?

Which (if any) of the compounds **J**, **K**, **L**, **M** and **N** are optically active?