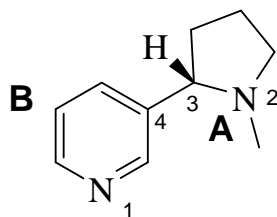


Marks
4

- The molecular structure of nicotine, the addictive component of tobacco, is shown below.



List the types of intermolecular interactions that each of the following sites on nicotine would be involved in when it is dissolved in water.

A – H bonding and dipole-dipole interactions

B – dispersion forces and dipole-induced dipole

Provide the requested information for each of the indicated atoms in nicotine.

| Atom | Geometric arrangement of the electron pairs around the atom | Hybridisation of the atom | Geometry around the atom |
|------|---|---------------------------|---|
| N-1 | trigonal planar | sp^2 | bent ($\sim 120^\circ$) |
| N-2 | tetrahedral | sp^3 | trigonal pyramidal |
| C-3 | tetrahedral | sp^3 | tetrahedral |
| C-4 | trigonal planar | sp^2 | trigonal planar |