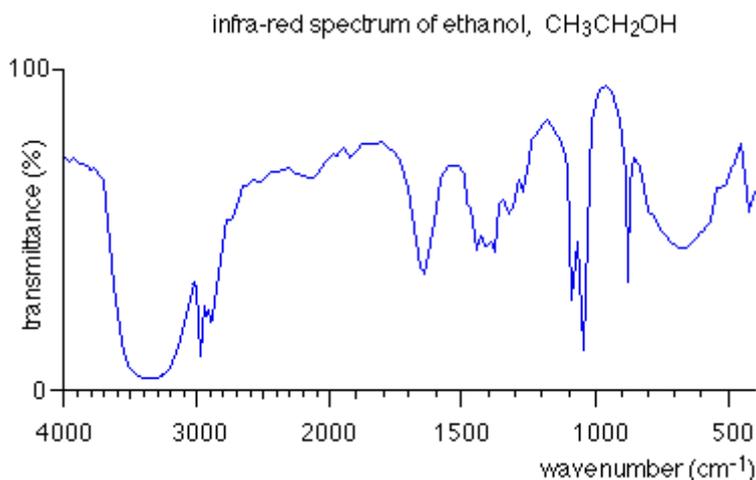


Chemguide – questions

INFRA-RED SPECTROSCOPY: INTRODUCTION

- When light energy from the Sun hits the Earth, some of it is re-transmitted as infra-red radiation. Some of this is absorbed by molecules in the air such as water vapour, carbon dioxide and methane. The extra energy gained by these molecules is passed on to other molecules during collisions, and the whole atmosphere is therefore warmed. This is one of the processes which keeps the temperature of the Earth suitable for life.
 - Explain briefly how the infra-red radiation is absorbed by the various molecules.
 - Infra-red radiation covers a whole range of frequencies, and therefore energies. Would you expect the three molecules mentioned to absorb infra-red radiation of the same frequency or different frequencies? Explain your answer.
- The diagram below shows the infra-red spectrum of ethanol:



- How, in principle, is a spectrum like this produced?
- The vertical axis is labelled as “transmittance (%)”. What does that mean?
- What is “wavenumber (cm^{-1})” a measure of?
- What causes the troughs in the graph?