

**Marks**  
**6**

• When cobalt(II) chloride is reacted with ethane-1,2-diamine (en) and the product is oxidised in the air, a purple compound with the empirical formula  $\text{CoCl}_3 \cdot 2\text{en}$  is obtained. When reacted with silver nitrate only one chloride ion is released. The compound can be resolved into its enantiomeric forms.

Give the structural formula of the compound.

Give the name of the compound.

Draw the structure of the metal complex component of the compound.

What is the *d* electron configuration of the Co in this complex?

What types of isomers can be formed by a compound with this empirical formula?

Which of the possible isomers has formed? Explain the logic you have used in determining this.