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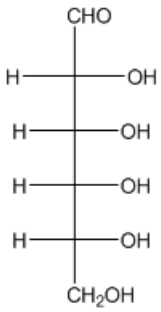
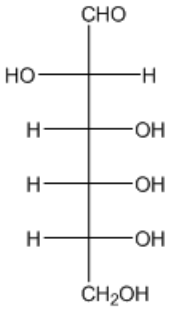
This problem is based upon the ideas used in the classic Fisher glucose proof.

Suppose you had four unknown D-aldohexoses, compounds A, B, C and D. The following reactions were run to identify compounds.



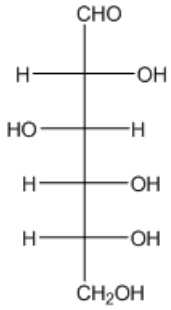
D-Allose

1



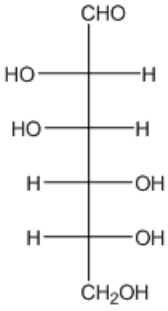
D-Altrose

2



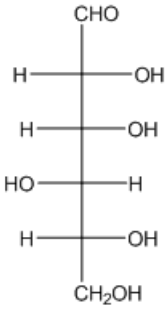
D-Glucose

3



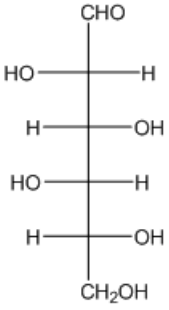
D-Mannose

4



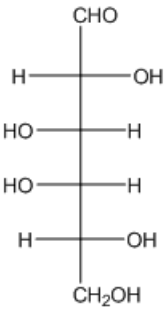
D-Gulose

5



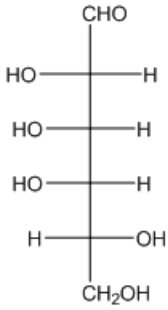
D-Idose

6



D-Galactose

7



D-Talose

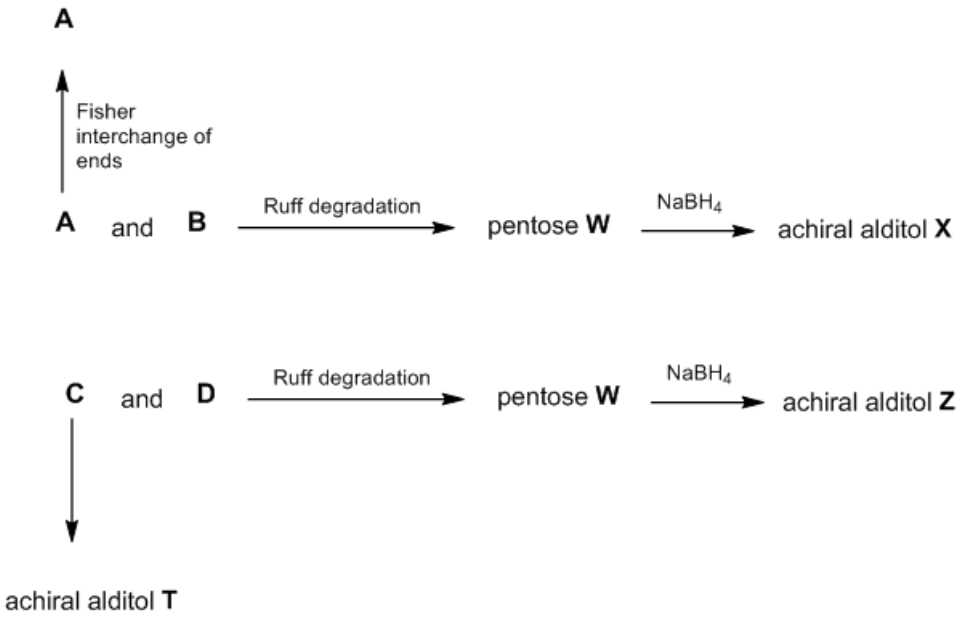
8

a. The Ruff degradation of a aldohexose removes the C-2 carbon and yields an aldopentose. The Ruff degradation of A and B gave the same pentose W. NaBH4 reduction of pentose W gave an achiral alditol X.

b. The Ruff degradation of C and D gave the same pentose Y. $NaBH_4$ reduction of pentose Y also gave an achiral alditol Z.

c. $NaBH_4$ reduction of C gave an achiral alditol, T.

d. Fisher developed a method for interchanging the ends of an aldohexose. Applying this procedure to aldohexose A gave back the same compound A.



Identify the four compounds **A**, **B**, **C** and **D**. On the answer form fill in the blanks using the numbers given under the structure names in the figure at the top of this page.

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