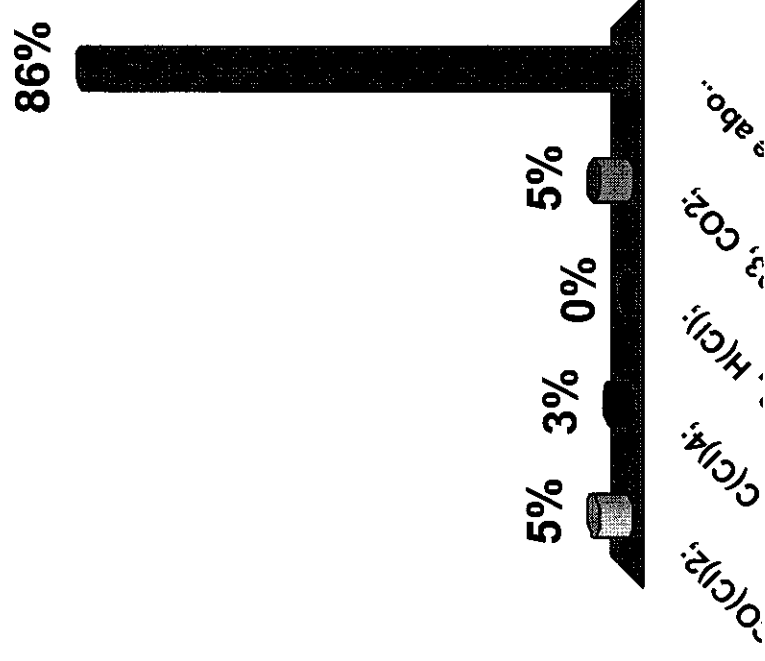


If a C atom has 4 of Dalton's hooks; an N atom, 3; an O atom, 2; a Cl and an H atom, 1 each; then which of the following pairs, if any, includes a compound inconsistent with Dalton's model (under which every actual compound must connect all of the available atomic hooks).

1.  $\text{COH}_2$ ,  $\text{CO}(\text{Cl})_2$ ;
2.  $\text{OH}_2$ ,  $\text{C}(\text{Cl})_4$ ;
3.  $\text{NH}_3$ ,  $\text{H}(\text{Cl})$ ;
4.  $\text{N}_2\text{O}_3$ ,  $\text{CO}_2$ ;
5. No pair: all of the above compounds are consistent with Dalton's model, as stated.



The correct answer is #5: None of the pairs includes an inconsistent compound; as follows (using C(4), N(3), O(2), H(1) and Cl(1)):

- To check count the number of unused hooks; e.g.,
- $\text{COH}_2$ :  $4 - 2 - 2 \cdot 1 = 0$ ...no unused hooks: OK!
- $\text{CO}(\text{Cl})_2$ :  $4 - 2 - 2 \cdot 1 = 0$  .... OK!
- $\text{C}(\text{Cl})_4$ :  $4 - 1 \cdot 4 = 0$  ...OK!
- $\text{OH}_2$ :  $2 - 2 \cdot 1 = 0$  ....OK!
- $\text{C}(\text{Cl})_4$ :  $4 - 4 \cdot 1 = 0$  ....OK!
- $\text{NH}_3$ :  $3 - 3 \cdot 1 = 0$  ....OK!
- $\text{H}(\text{Cl})$ :  $1 - 1 = 0$  ...OK!
- $\text{N}_2\text{O}_3$ :  $2 \cdot 3 - 3 \cdot 2 = 0$  ...OK!
- $\text{CO}_2$  :  $4 - 2 \cdot 2 = 0$  ...OK!
- Thus, all of the above compounds are consistent with Dalton's model, as stated, and no pair has an inconsistent compound.
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