6-15

According to 6.233 and 6.235 we have

$$\langle 10|r|10\rangle = \frac{1}{2}[3 \times 1^2 - 0(0+1)]a_0 = \frac{3}{2}a_0$$

$$\langle 10|r^2|10\rangle = \frac{1}{2} \times 1^2[5 \times 1^2 + 1 - 3 \times 0(0+1)]{a_0}^2 = 3{a_0}^2$$

Thus

$$\Delta r = \sqrt{3{a_0}^2 - \left(\frac{3}{2}a_0\right)^2} = \frac{\sqrt{3}}{2}a_0$$

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Translated by: