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## Question

A spherical capacitor is formed from two concentric spherical conducting shells separated by vacuum. The inner sphere has radius 10.0 centimeters, and the separation between the spheres is 1.50 centimeters. The magnitude of the charge on each sphere is 3.30 nanocoulombs.

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(a) By  $V = Q/4\pi\epsilon_0[1/a - 1/b]$   
 $\Rightarrow V = [3.30 \times 10^{-9}/(4 \times 3.14 \times 8.85 \times 10^{-12})] \times [1/0.1 - 1/0.115]$   
 $\Rightarrow V = 29.69 \times 1.30$   
 $\Rightarrow V = 38.73 \text{ volt}$   
 (b) By  $W = 1/2 VQ$   
 $\Rightarrow W = 1/2 \times 38.73 \times 3.30 \times 10^{-9} = 6.39 \times 10^{-8} \text{ J}$

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$\Delta V = 38.7V$

enegery stored =  $6.38 \times 10^{-8}$

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