1) Calculate the average mass of one atom of iridium:
$m_0 = M/N_a$

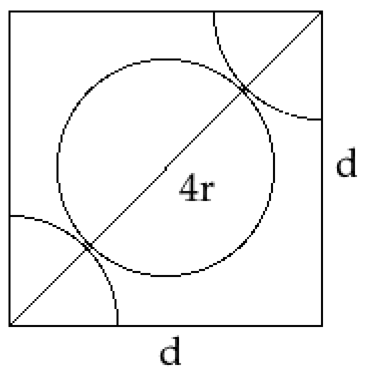
$m_0 = 192.2$ g/mol ÷ 6.022×10^{23} atoms $mol^{-1} = 3.19163 \times 10^{-21}$ g/atom

2) Calculate the mass of the 4 iridium atoms in the face-centered cubic unit cell:
3.19163×10^{-21} g/atom times 4 atoms/unit cell = 1.27665×10^{-20} g/unit cell

3) Use density to get the volume of the unit cell:
$V = m_0/\rho = 1.27665 \times 10^{-20}$ g ÷ 22 g/cm^3 = 5.80295×10^{-22} cm^3

4) Determine the edge length of the unit cell:
$V = d^3$ d = 5.80295×10^{-22} cm$^{3\wedge}$ 1/3= 0.387153×10^{-8} cm

5) Determine the atomic radius:
Here is the same view, with 'd' representing the side of the cube and '4r' representing the 4 atomic radii across the face diagonal.



Using the Pythagorean Theorem, we find:
$d^2 + d^2 = (4r)^2$
$2d^2 = 16r^2$
$r^2 = d^2 \div 8$
$r = d \div 2(\sqrt{2})$
$r = 0.387153 \times 10^{-8}$ cm $\div 2(\sqrt{2}) = 1.3688 \times 10^{-7}$ cm

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