

From Griffiths: 7.1, 7.5, 7.11, 7.13, 7.16, 7.18

1. A spherical conducting electrode of radius a is surrounded by a medium obeying Ohm's law whose conductivity $\sigma(r)$ is a function of distance from the center of the electrode. A steady current flows from the electrode.
 - (a) Derive an equation for the relationship between the electric field, conductivity, and, the total current I .
 - (b) What should $\sigma(r)$ be so that the charge density in the medium is 0?
 - (c) What should $\sigma(r)$ be so that the charge density in the medium is a constant?