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Electroosmotic access resistance of a nanopore[1]
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troosmotic flow through a nanopore that traverses a dielectric membrane
with a fixed surface charge density is considered. In the limit where the
surface charge is small and the applied electric field weak, the recipro-
cal theorem is used to derive an expression for the electroosmotic flux
through the pore up to quadratures over the fluid volume. Thus, an
"electroosmotic conductance (the fluid flux per unit applied voltage)
may be defined in analogy to the corresponding electrical conductance
of a hole in an insulating membrane immersed in a uniform conductor.
In the limit when the membrane is thick compared to the pore diam-
eter, the usual result for the electroosmotic conductance through long
cylindrical channels (which varies inversely as the membrane thickness)
is recovered. The electroosmotic conductance is shown to approach a
finite value for an infinitely thin membrane: this residual electroosmotic
resistance (inverse of conductance) is analogous to the concept of "ac-
cess resistance of a pore in the corresponding electrical problem. The
dependence of the electroosmotic conductance on pore radius, Debye
length and membrane thickness is investigated.

REFERENCES *JFM* (2014) **749**, 167; *Langmuir* (in press)

X	Prefer Oral Session
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