

Abstract Submitted
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Fluorine Functionalized BNNT as a Spin Filter¹ KAMAL DHUN-
GANA, RANJIT PATI, Michigan Technological University — Spin filtering is a phe-
nomenon that allows one to generate spin-polarized carriers in a circuit comprised
of a magnetic channel sandwiched between two non-magnetic electrodes. In recent
years, the quest for a novel low-dimensional metal-free magnetic channel that would
exhibit both magnetism at a higher temperature and excellent spin filtering property
has been intensively pursued. Herein, using a first-principles approach, we study the
magnetic property of fluorine functionalized boron nitride nanotube (F-BNNT). A
long range ferromagnetic spin ordering is found to occur in the F-BNNT at temper-
ature much above the room temperature. Our spin polarized transport study shows
that the fluorine functionalization in BNNT not only enhances its conductance by
more than two orders, which is in excellent agreement with the experimental report,
but also makes it a perfect spin filter.

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