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Boron coated single crystalline wurzite gallium nitride nanowires

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Boron coated single crystalline wurzite gallium nitride nanowires are synthesized in bulk quantity by a catalytic reaction of gallium source (gallium and gallium nitride powder) and boron oxide mixture with ammonia on Ni-deposited alumina substrate. The majority of nanowires have a diameter in the range of 5-10 nm. As the diameter increases, they exhibit a stacked polygonal cone shape, looking like a tree. All of the nanowires have the same growth direction, [001]. Amorphous boron outerlayer is identified by transmission electron microscopy and electron energy loss spectroscopy.