The World's Largest Epitaxial Superconducting Film (30cm×10cm)

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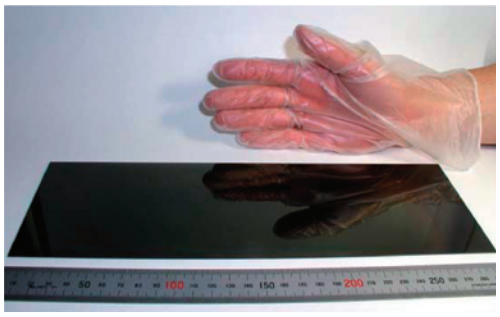
AIST has succeeded in preparing the world's largest (30cm×10cm) epitaxial superconducting $YBa_2Cu_3O_7$ film on CeO_2-buffered sapphire substrate by coating-pyrolysis process. This process produces $YBa_2Cu_3O_7$ film by "applying and then burning" a coating solution, so that mass production can be realized at a far lower cost than that of vapor-phase processes. This film is epitaxially grown with preferentially oriented particles, and shows a very high superconducting characteristic that the average critical current density at liquid nitrogen temperature is over 1,000,000 A/cm^2. This large-area superconducting film can apply to passive microwave devices such as filters or antennas, and fault current limiters.



Photograph of the epitaxial $YBa_2Cu_3O_7$ film (30cm×10cm)

Mechanical Engineering and Manufacturing Technology

Recycling of Waste Colored Glass

- A new type of fluorescent glass obtained from waste glass -

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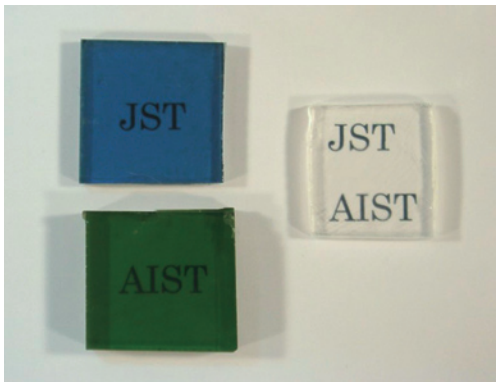
A new method to decolorize the waste colored glass is newly proposed. In this method, the colored waste glass is converted to colorless transparent porous glass employing similar method for preparing conventional porous glass. To obtain more valuable recycled product, a fluorescent glass is prepared by loading small amount of metal ions in the porous glass followed by sintering.



Waste colored glass (left) and porous transparent coloreless glass botained from the waste glass (right)