

**Producing Multicharged Fullerene Ion Beam Extracted  
from the Second Stage of Tandem Type ECRIS**

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Synthesis of endohedral fullerene has been investigated on tandem type electron cyclotron resonance ion source (ECRIS) in Osaka Univ. Endohedral fullerene is expected to be utilized for such as quantum computing or magnetic resonance imaging contrast agent, because it has various material character.<sup>1</sup> The tandem type ECRIS comprises the first stage, the second stage, beam line, and irradiation stage.<sup>2</sup> The first and the second stage are possible to generate plasma individually, and also they are confined individual ion species by each different plasma parameter. Hence, it is considered to be suitable for the synthesis of materials.

In order to supply fullerene vapor in high vacuum, a new evaporator is developed. The evaporator is constructed with Ta ohmic wire heater and crucible filled with the fullerene powder. Fullerene vapor is supplied to the second stage from this evaporator, and we try to produce and extract multicharged fullerene ions. In this experiment, He gas is supplied to the second stage to keep plasma stable. Multicharged fullerene spectrum are successfully observed for the first time in the tandem type ECRIS. In future, we are going to synthesize iron endohedral fullerene by iron ion beam transport to the second stage from the first stage.

**References**

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2. Y. Kato, *et.al*, Rev. Sci. Instrum. **85**, 02A950 (2014)