The first test of the ion implantation beamline at VIBA

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Introduction

- VIBA (Versatile Ion Beam Accelerator) is a compact linear accelerator facility using 28GHz ECR ion source at KBSI (Korea Basic Science Institute). The goal of VIBA is to support various researchers using low-energy ion beams.
- The purpose of VIBA is one-stop ion beam facilities and analysis platform for supporting industry, academia, institution. VIBA gives the researchers a chance to collaborate in high dose ion implantation.

First test results of ion implantation

- From 2015, VIBA (Versatile Ion Beam Accelerator) had serviced ion implantation. Beam service had given for 15 users (27 cases), specially we had found a possibility of ion implantation at electrochemical sensors.

Representative instance

Result of transport simulation

Service conditions for ion implantation

<table>
<thead>
<tr>
<th>Ion</th>
<th>Energy (keV)</th>
<th>Current (mA)</th>
<th>Dose (O/µm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>20-52</td>
<td>100-380</td>
<td>2.77E16-1.05E+17</td>
</tr>
<tr>
<td>O</td>
<td>30-60</td>
<td>70-360</td>
<td>1.5E16-8.24E+16</td>
</tr>
<tr>
<td>He</td>
<td>20</td>
<td>160-185</td>
<td>6.64E16-7.67E+16</td>
</tr>
<tr>
<td>Ar</td>
<td>40-78</td>
<td>90-180</td>
<td>2.49E16-3.46E+16</td>
</tr>
</tbody>
</table>

Changed new plan for VIBA facility

- We changed plan for VIBA application from feasibility study about implantation. R&D schedule for implantation service started in this year.

Design of beamline for ion implantation

- In this year, Diagnosis system of VIBA was changed for ion implantation. Chambers were separated from conventional the diagnostic chamber for improve ion implantation.

Install of beamline for ion implantation

- From design results, we manufactured and installed new beamline. We will finish modification of operation program until this year.

Current status of beamline