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## Recent highlights and perspectives on chemical deuteration activities in CROSS

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Since 2017, CROSS D-Lab has been developing and operating equipments for J-PARC users to perform chemical deuteration and analysis of D-labeled molecules. So far, aromatic compounds, ionic liquids, and other organic molecules have been deuterated using heterogeneous platinum-group catalysts under hydrogen gas-free conditions, and these molecules have been used in neutron experiments at J-PARC MLF. Additionally, physical and chemical analysis methods such as NMR and elemental analysis have been under development for the analysis of the chemical and isotopic purity of D-labeled molecules.

Recently, research on heavy water recycling systems meeting the requirements of the economy and ecology has been carried out with a Japanese company. As a result, the cost of the deuterium labeling has been decreased by the recycling technique.

In this presentation, we will show in detail recent highlights and perspectives of chemical deuteration activities in CROSS D-Lab.

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