



**Ms. SHALLY GUPTA**

Physical Sciences Research Area,  
Tata Research Design and Development Centre (Pune, India)

will deliver a seminar entitled

**Process for the recovery of Neodymium and Dysprosium  
from hard disk magnets**

on **Wednesday, September 25th, 2019 at 3.30 pm**  
in Mezzanine room

A design of experiments study was carried out on a 4:1 mixture of Nd and Dy ions in chloride media, representative of their ratios found in NdFeB magnets, with n-heptane as the diluent. Though the concentration of Dy is four times smaller, the selectivity of D2EHPA toward Dy can be exploited to obtain enhanced separation in a two-step process by first extracting Dy at low pH and starving doses of D2EHPA, followed by the extraction of Nd at higher pH.

The two-step process was further used to develop an end-to-end recycling process for the recovery of rare earth elements, dysprosium (Dy) and neodymium (Nd) from used hard disk magnets (NdFeB). The effect of roasting temperature was studied in a range of 923-1273 K. The process parameters such as roasting and leaching temperature, acid concentration and pulp density were optimized to selectively leach Nd and Dy while most of the iron (Fe) was removed by the hydrolysis of Fe into  $\text{Fe}(\text{OH})_3$ . Nd and Dy were extracted from the leach liquor using D2EHPA in a two-step process. First, ~95% of Dy was extracted at a pH=2, and 0.05 M D2EHPA and then Nd was extracted at pH=4 and 0.2 M D2EHPA. Dy and Nd were completely recovered from the loaded organic phase by stripping with HCl.

