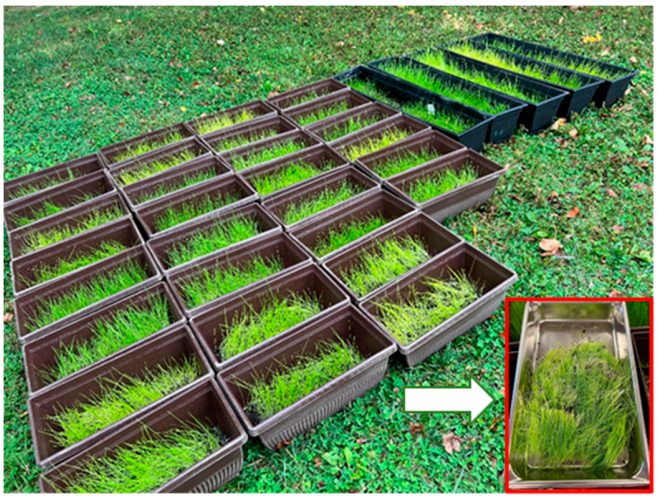


**Figure S1.** REE hyperaccumulator plant grass and harvested GL (inset).

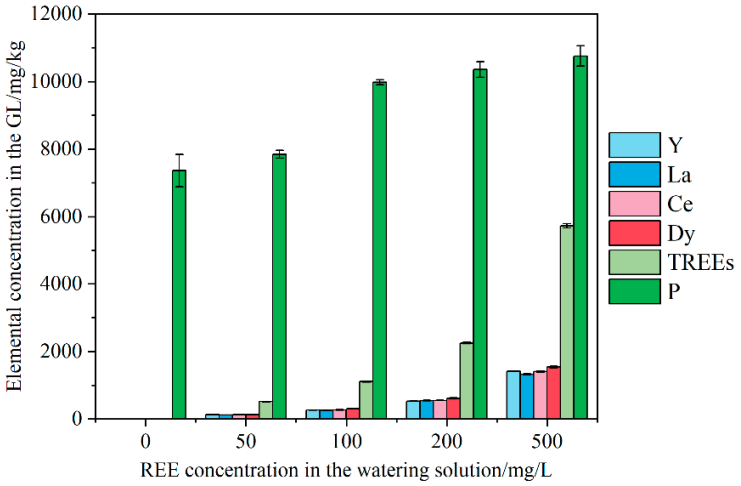



**Figure S2.** Effect of REE concentration in watering solution on the elemental concentration in the GL.

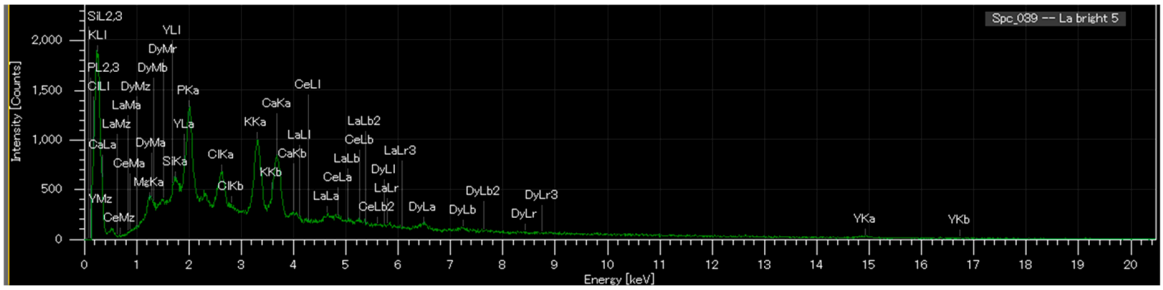



**Figure S3.** EDS spectrum of the particle found from the GL.

**Table S1.** Chemical compositions (Mol%) of the GL analyzed by EDS spectrum.

| Chemicals | MgO | $SiO_2$ | $P_2O_5$ | Cl | $K_2O$ | CaO | $Y_2O_3$ | $La_2O_3$ | $CeO_2$ | $Dy_2O_3$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Mol% | 14.65 | 10.00 | 21.84 | 12.26 | 12.80 | 20.18 | 3.79 | 1.25 | 2.23 | 0.99 |

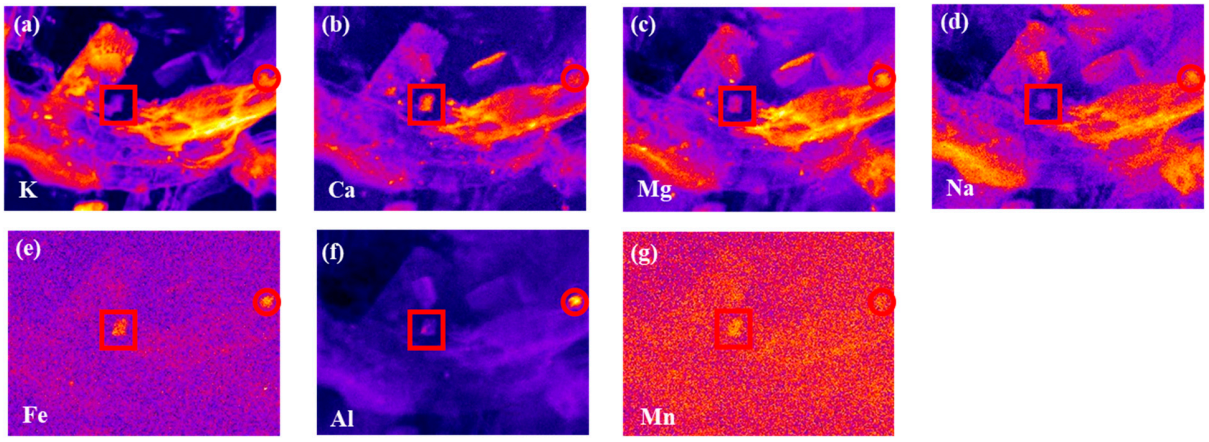



**Figure S4.** WDS mapping of different elements in the GL (a)~(g).

It was found that the areas containing high concentrations of REEs and P also contained some other metals, such as K, Ca, Mg, Na, Fe, Al, and Mn (Figure S4).

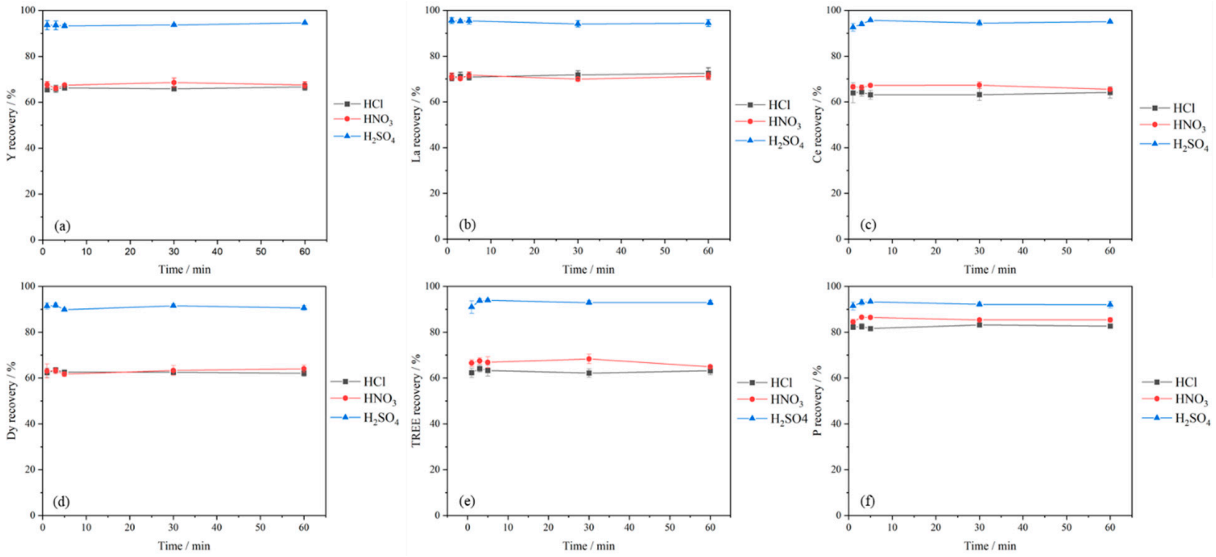



**Figure S5.** Effect of acid types on the elementary recovery from the GL.

As can be seen from Figure S4, the reaction time has a negligible influence on the recovery of Y, La, Ce, Dy, and P from the GL. Therefore, 5 min was chosen for the following acid leaching tests.

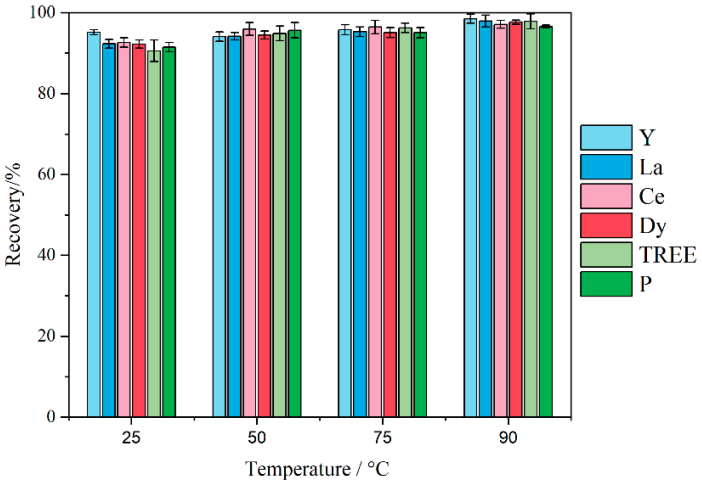



**Figure S6.** Effect of temperature on the elementary recovery from the GL.

It was shown in Figure S5 that the reaction temperature also exerted a negligible effect on the recovery of REEs and P. Therefore, 25 ºC was selected for all acid leaching tests.