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A major market for steelmaking slags is for cement manufacture. However, many slags contain a significant amount of metallic iron, which can cause cracking and staining of concrete when the iron oxidizes. Removal of this iron from slag not only improves the suitability of the slag for cement manufacture, it also recovers metallic iron that has considerable value as metal and can then be recycled.

As a portion of the above project, slags from six different sources were processed by magnetic separation to determine the quantity of iron that could be recovered. All of the slags contained between 16% and 36% of magnetic iron that could be recovered readily by this means. It was also observed that the slags contained a certain amount of elemental carbon, which formed a hydrophobic layer. The carbon content was sufficiently low that it would not be a problem in cement production, but if a slag contained excessive amounts of carbon it would be straightforward to use a froth flotation process to remove it.

The cementitious properties of the slags were due to the availability of calcium-rich phases in the slags. The primary phases responsible that were identified by X-ray diffraction were Ca_2SiO_4 , $\text{Ca}_{12}\text{Al}_{14}\text{O}_{33}$, and CaFeSiO_4 . No free lime was detected in any of the slags, and the cementing phases that were seen in the diffraction patterns tended to be relatively calcium-poor compared to standard Portland cement. This suggests that these slags would be excellent additives for cement, provided that other sources of calcium were available and the carbon content was not excessive.