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Influence Of P Addition On Microstructure And Magnetic Properties Of Pr₁₅Fe₁₄Co₇B₈Nb_{0.05} and Pr₁₅Fe₁₄Co₇B₈Nb_{0.05}P_{0.25} Sintered Magnets

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The microstructure and magnetic properties of Pr₁₅Fe₁₄Co₇B₈Nb_{0.05} and Pr₁₅Fe₁₄Co₇B₈Nb_{0.05}P_{0.25} sintered magnets have been evaluated in the present work. The latter has presented superior maximum energy product and squareness factor compared to the former, but with a lower intrinsic coercivity (iH_c). By scanning electron microscopy (SEM) it has been verified that the P addition caused the grain growth of the hard magnetic phase. Using transmission electron microscopy (TEM), it has been observed that P is located either in the triple points, together with the Pr-rich phase, or in the Pr₂(Fe,Co)₁₄B phase with a uniform distribution. Besides, the P addition has caused an incomplete magnetic separation (irregular grain boundary) between the magnetic grains, which might explain the lower iH_c of such magnet.