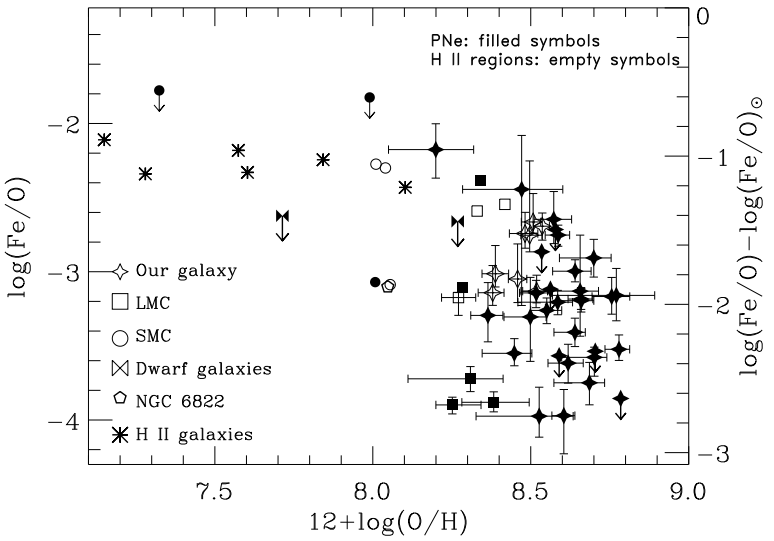

Fig. 1. Values of Fe/O (left axis) and the depletion factors for Fe/O ([Fe/O] = log(Fe/O) − log(Fe/O)$_\odot$, right axis) as a function of the oxygen abundance. Total iron abundances were derived using equations 3 and 4 of Rodríguez & Rubin (2005). Upper limits represent objects with a doubtful identification of the [Fe III] line used in the calculations.

bution of higher ionization states with the ionization correction scheme of Rodríguez & Rubin (2005). We also calculated the iron abundances in a sample of H II galaxies and some extragalactic PNe and H II regions from the literature (Peimbert 2003; Tsamis et al. 2003a,b; Rodríguez & Rubin 2005; Leisy & Dennefeld 2006; Kniazev et al. 2007, 2008; Peimbert et al. 2005; Izotov et al. 2009; López-Sánchez & Esteban 2009).

Figure 1 shows our results for the Fe/O abundance ratio, as well as an estimate of the depletion factor [Fe/O] = log(Fe/O) − log(Fe/O)$_\odot$, as a function of the oxygen abundance for all the objects. We refer the reader to Rodríguez & Rubin (2005) for a discussion of the use of the solar abundance ratio (Fe/O)$_\odot$ to estimate depletion factors at different metallicities.

Rodríguez & Rubin (2005) found a trend of decreasing depletions at lower metallicities. Figure 1 shows a similar result but for a larger sample of objects. This trend is mainly defined by H II galaxies (see also Izotov et al. 2006) and it shows a higher dispersion as the metallicity increases. The trend suggests that iron atoms are significantly less attached to dust grains at low metallicity. This could be due to changes in the efficiencies of the processes responsible for dust formation, growth or destruction.

As we mentioned above, PNe can provide information about the efficiency of circumstellar dust production. However, data for low metallicity PNe are scarce and unreliable (since they are often based on doubtful line identifications). The LMC PNe show iron depletion factors similar to the ones found in Galactic PNe, but PNe with lower metallicity could have lower iron depletions, as in the case of the H II regions. To answer this question, and to study the changes with metallicity of the total range of depletion factors, deep spectra for a larger sample of low-metallicity nebulae, especially PNe, are needed.

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