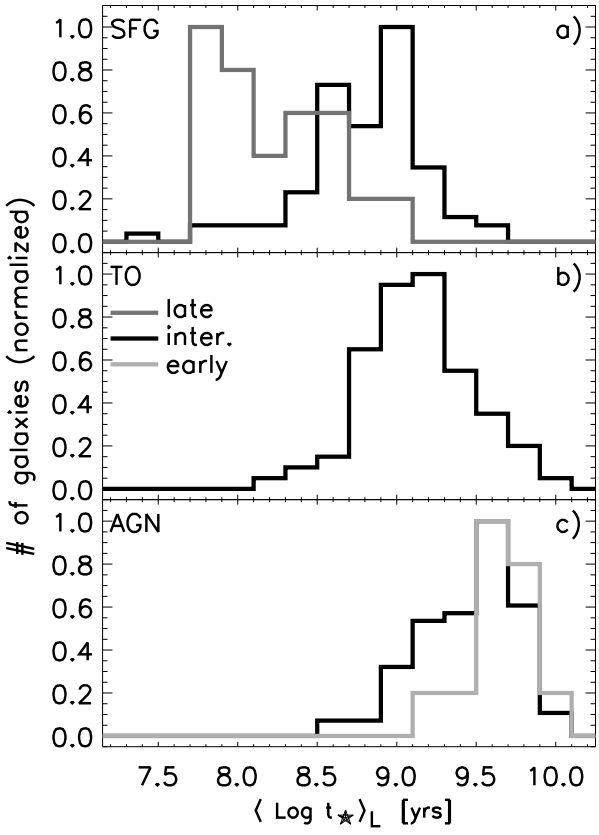

Fig. 12. Distributions of mean ages of stellar populations for galaxies with different activity types and different morphologies. The color figure can be viewed online.

(Sandage 1986), transforming almost all their gas into stars in a very short period of time. Assuming that galaxies form by a succession of star forming episodes–an assumption necessary to produce the mass-metallicity relation–galaxies with high astration rates would thus be expected to have formed most of their stars in the past because, the reservoir of gas being limited, the galaxy would have consumed it rapidly and stopped forming stars relatively early. This would explain the differences in mean ages for the stellar populations observed in our sample of isolated NELGs.

3.4. *Relation with gas metallicity*

After correcting for dust absorption, the metallicities of the gas in the SFGs were estimated using the empirical correlation found between log(O/H) and the emission-line ratio $R_3 = ([\mathrm{OIII}]\lambda4959 + [\mathrm{OIII}]\lambda5007)/\mathrm{H}\beta$ (Edmunds & Pagel 1984; Vacca & Conti 1992). The correlation originates from the cooling effect of oxygen: as the metallicity of the gas increases, the gas is cooled more efficiently, the temperature drops and the line ratio R_3 decreases (McCall, Rybski, & Shields 1985; Evans & Dopita 1985).

TABLE 6

EXAMPLES OF GAS METALLICITIES AND ABSOLUTE B MAGNITUDES OF SFGS[†]

Identification in SDSS	[O/H]	M_B
SDSS J105809.84−004628.8	0.26	−18.46
SDSS J135807.05−002332.9	0.43	−19.68
SDSS J142223.76−002315.5	0.31	−17.11
SDSS J115425.04−021910.3	0.20	−16.35
SDSS J170128.21+634128.0	0.47	−18.65
SDSS J214907.29+002650.3	0.51	−18.28
SDSS J235106.25+010324.1	0.48	−17.67
SDSS J021859.64+001948.0	0.44	−18.69
SDSS J025154.58+003953.3	0.29	−19.06
SDSS J003823.71+150222.4	0.38	−18.69

[†]Full table available in electronic form at `http://www.astroscu.unam.mx/rmaa/RMxAA..47-2/RMxAA..47-2_rcoziol-tables.zip/`.

The gas metallicities in the SFGs are compiled in Table 6, together with their absolute B magnitudes. We assume the solar metallicity is $12 + \log(\mathrm{O/H}) = 8.66 \pm 0.05$ (Asplund et al. 2004). The uncertainty in the metallicities is of the order of ± 0.2 dex (Edmunds & Pagel 1984). In Figure 13 we plot the gas metallicities in the SFGs against their absolute B magnitudes. The results are in excellent agreement with what is expected based on their late-type morphologies (Zaritsky, Kennicutt, & Huchra 1994). The results are also in good agreement with what was observed in Starburst Nucleus Galaxies (SBNGs): the gas in the late-type SBNGs is more metal rich than in the early-type SBNGs, due to their different formation processes (Coziol et al. 1998b).

The usual way to determine the metallicity of AGNs is to compare the observed line ratios with the outputs obtained using an ionization code like CLOUDY (Ferland et al. 1998). However, the results are usually ambiguous, with more than one possible solution (Nagao, Maiolino, & Marconi 2006). There maybe also other physical mechanisms, like shocks or special ionizing structures, that can complicate the interpretation based solely on photoionization model results (Viegas & de Gouveia dal Pino 1992; Cooke et al. 2000).

An excellent study was presented recently by Bennert et al. (2006). With the permission of the