1. Some Relevant Conventional Notation Used in Astronomy

[X] = log(X)(for the object) – log(X)(for the Sun)

In describing abundances, one can use [A/B], which is the ratio of element A to B, relative to that ratio for the Sun, expressed as log10.

The absolute abundance of a species X is often denoted by ϵ(X), where the normalization is such that ϵ(H) =10^{12}. Thus a species K which has log[ϵ(K)] = 1.0 dex has a ratio n(K)/n(H) of 10^{-11}.

brightness of objects – magnitude scale,

apparent magnitude = A $- 2.5 \times$ log(Flux at Earth), brightest stars in sky have apparent mag -1.

Absolute mag = apparent mag of the object at a standard distance, fixed at 10 pc, where 1 pc is the distance at which the Earth's orbit around the Sun subtends an angle of 1 arcsec, 1 pc = 3.08×10^{18} cm.

z refers to redshift. Z refers to the abundance by mass of elements other than H or He. X is the abundance by mass of H, Y is that of He.

Stages of stellar evolution for stars in mass range about 1 to $3M_{\odot}$: MS = main sequence (H burning in core), followed by RGB = red giant branch, H exhausted in core, H burning in shell, stellar core contracting, envelope expanding, followed by He flash (ignition of He burning in a degenerate core), leading to HB (horizontal branch) - He burning in core, followed by AGB (asymptotic giant branch) He exhausted in core, He and H burning shells,

eventually pulsational instability with substantial mass loss, planetary nebulae, cooling to a white dwarf.

Higher mass stars ignite He in a non-degenerate core, so no He flash. by AGB (asymptotic giant branch)