MASSIVE STARS: EVOLUTION WITH MASS LOSS. III. LOW METAL STARS, AND WR'S IN SMC

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In this paper we investigate the effect of mass loss by stellar wind on the evolution from the main sequence to the He exhaustion stage of stars in the range of mass 20 to 100 $M_\odot$ with low metal abundance. To this purpose we compute the set of evolutionary sequences with initial mass 20, 30, 40, 60, 80, and 100 $M_\odot$ and chemical composition parameters X=0.700, Z=0.001. The models are first computed at constant mass to provide the fundamental network to which we compare the mass losing models. This choice of the initial chemical composition is aimed to represent the case of luminous supergiants in the Small Magellanic Cloud. The rate of mass loss follows the formulation of Castor, Abbot and Klein (1975), but it incorporates the effect of different metal content in the regions of high effective temperatures in the HR diagram. The rate of mass loss for models at low effective temperature is given by the acoustic flux mechanism according to the formulation of Chiosi, Nasi and Sreenivasan (1978). The results are compared with those of Chiosi, Nasi and Sreenivasan (1978), and those of Chiosi, Nasi and Bertelli (1979) for normal metal abundance supergiant stars of the Galaxy. On the basis of the present results we suggest an interpretative scenario for the existence of single WR stars in galaxies of different chemical composition. These results allow us to interpret also the different percentages of WR's among subclasses that are observed in the Galaxy, LMC, and SMC (Conti and Vanbeveren, 1979).

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