Page 216, equation (4.344)

First, note that combining (4.30) with (4.26) we obtain:

$$\sum_{\alpha=1}^{n} S_{\sigma\alpha} J^{\alpha} = \sum_{\alpha=1}^{n} S_{\sigma\alpha} \frac{r_\alpha}{M_\alpha} = 0 \qquad \sigma = 1, ..., h. \tag{1}$$

Balance (4.14) gives for $\mathbf{v}_\alpha = \mathbf{o}$:

$$\frac{\mathrm{d}}{\mathrm{d}t} \int_V \rho_\alpha \, \mathrm{d}v = \int_V r_\alpha \mathrm{d}v \qquad \alpha = 1, ..., n. \tag{2}$$

Multiplying (2) by a constant $S_{\sigma\alpha}/M_\alpha$ it follows:

$$(S_{\sigma\alpha}/M_\alpha) \frac{\mathrm{d}}{\mathrm{d}t} \int_V \rho_\alpha \, \mathrm{d}v = (S_{\sigma\alpha}/M_\alpha) \int_V r_\alpha \mathrm{d}v \qquad \sigma = 1, ..., h; \; \alpha = 1, ..., n. \tag{3}$$

Summing up (3) for all constituents:

$$\sum_{\alpha=1}^{n} (S_{\sigma\alpha}/M_\alpha) \frac{\mathrm{d}}{\mathrm{d}t} \int_V \rho_\alpha \, \mathrm{d}v = \sum_{\alpha=1}^{n} (S_{\sigma\alpha}/M_\alpha) \int_V r_\alpha \mathrm{d}v,$$

$$\frac{\mathrm{d}}{\mathrm{d}t} \int_V \sum_{\alpha=1}^{n} (S_{\sigma\alpha}/M_\alpha) \rho_\alpha \, \mathrm{d}v = \int_V \sum_{\alpha=1}^{n} (S_{\sigma\alpha}/M_\alpha) r_\alpha \mathrm{d}v = 0 \qquad \sigma = 1, ..., h \tag{4}$$

where (1) was used in the last equality.

Taking into account that $\rho_\alpha \mathrm{d}v = w_\alpha \mathrm{d}m$ (see the book) and multiplying (4) by E^σ (a constant), eq. (4.344) follows.