with Equations (13) and (15). Equation (64) should be primarily of interest when constituent phase transformations seem likely. The form of Equation (64) applicable to this case has been outlined in the preceding section. Equation (63) can be employed to effect the transfer of thermal energy between constituents. A possible form for Equation (63) is a linear combination of the internal energy differences.

$$\underset{\sigma}{\hat{\epsilon}}_{\alpha} = \sum_{\beta} f_{\beta\alpha}(\epsilon_{\bar{\beta}}^{-} - \epsilon_{\bar{\beta}}^{-}) \tag{65}$$

Equation (15) is then satisfied whenever

$$\sum_{\beta} (f_{\beta\alpha} - f_{\alpha\beta}) = 0 \tag{66}$$

More complex forms for Equation (63) can be postulated employing the constituent temperatures.

In a future paper, we shall employ the theory presented above to represent certain two- and three-constituent mixtures and compare this representation with experimental Hugoniot results.

NOMENCLATURE

$\mathbf{N}$ = unit normal vector to shock surface
P = pressure
$\mathbf{T}$ = stress tensor
$\mathbf{U}$ = velocity vector of shock surface
X_α = particle of S_α
c_α = concentration or mass fraction for S_α
$\underset{\sigma}{\hat{c}}_\alpha$ = mass supply for S_α
$\mathbf{h}$ = heat flux
$\underset{\sigma}{\mathbf{m}}_\alpha$ = momentum supply for S_α
n_α = volume fraction for S_α
S_α = constituent α
t = time
$\mathbf{u}_\alpha$ = diffusion velocity for S_α
$\mathbf{v}$ = velocity vector
$\mathbf{x}$ = position
ϵ = internal energy
$\underset{\sigma}{\hat{\epsilon}}_\alpha$ = energy supply for S_α
η = compression
ρ = mass density
[ ] = denotes jump crossing shock

Subscripts

α, β = identify constituent
0 = initial value

Superscripts

+ = value leading shock
– = value following shock

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