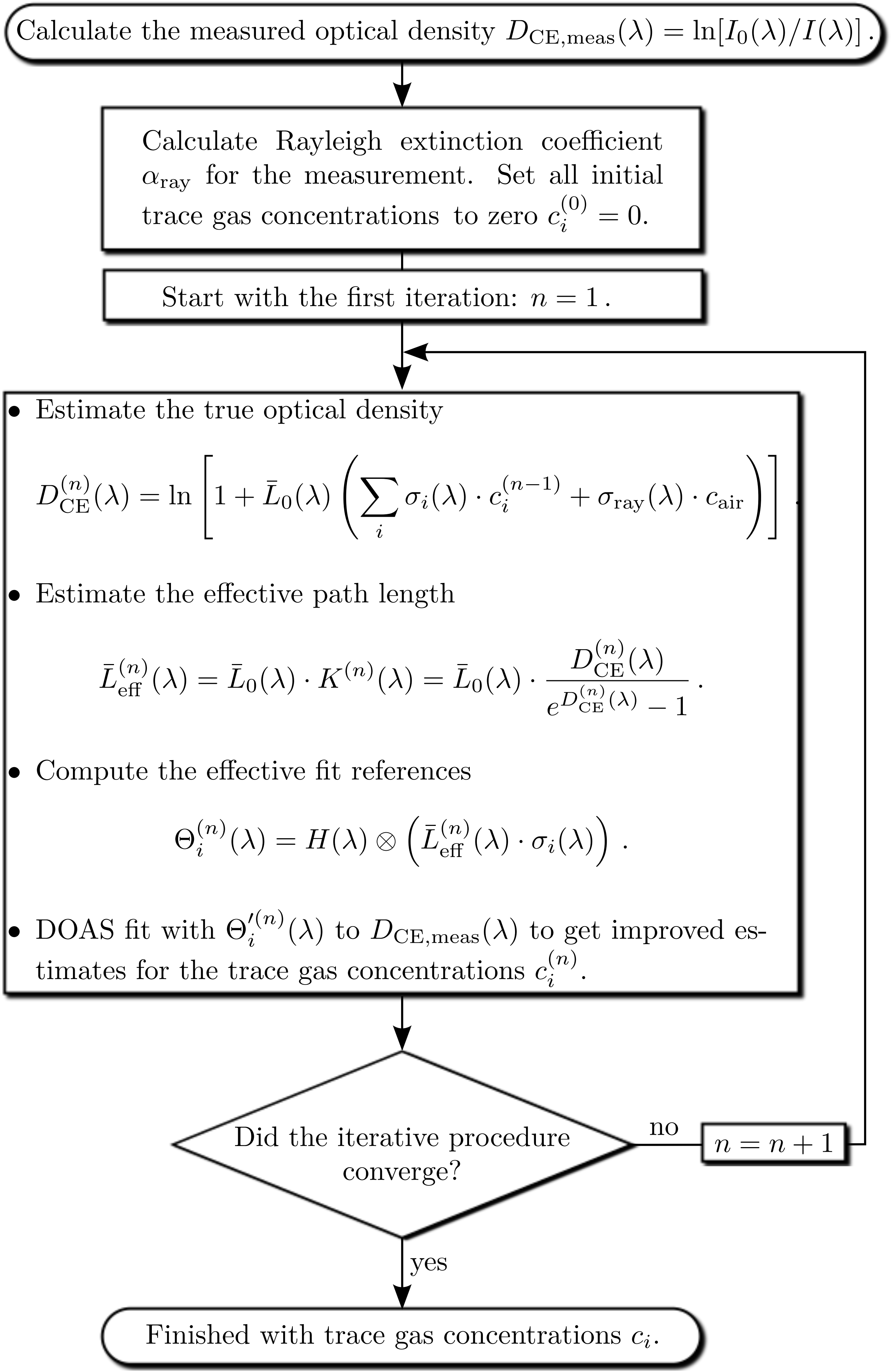

Calculate the measured optical density $D_{\mathrm{CE,meas}}(\lambda) = \ln[I_0(\lambda)/I(\lambda)]$.
Calculate Rayleigh extinction coefficient α_{ray} for the measurement. Set all initial trace gas concentrations to zero $c_i^{(0)} = 0$.
Start with the first iteration: $n = 1$.
• Estimate the true optical density
$$D_{\mathrm{CE}}^{(n)}(\lambda) = \ln\left[1 + \bar{L}_0(\lambda)\left(\sum_i \sigma_i(\lambda)\cdot c_i^{(n-1)} + \sigma_{\mathrm{ray}}(\lambda)\cdot c_{\mathrm{air}}\right)\right].$$
• Estimate the effective path length
$$\bar{L}_{\mathrm{eff}}^{(n)}(\lambda) = \bar{L}_0(\lambda)\cdot K^{(n)}(\lambda) = \bar{L}_0(\lambda)\cdot\frac{D_{\mathrm{CE}}^{(n)}(\lambda)}{e^{D_{\mathrm{CE}}^{(n)}(\lambda)} - 1}.$$
• Compute the effective fit references
$$\Theta_i^{(n)}(\lambda) = H(\lambda)\otimes\left(\bar{L}_{\mathrm{eff}}^{(n)}(\lambda)\cdot\sigma_i(\lambda)\right).$$
• DOAS fit with $\Theta_i'^{(n)}(\lambda)$ to $D_{\mathrm{CE,meas}}(\lambda)$ to get improved estimates for the trace gas concentrations $c_i^{(n)}$.
Did the iterative procedure converge?
no
$n = n + 1$
yes
Finished with trace gas concentrations c_i.