



$$6. \quad \frac{\partial u}{\partial t} = \frac{a}{x^n} \frac{\partial}{\partial x} \left( x^n \frac{\partial u}{\partial x} \right) + u^k f \left( \frac{u}{w} \right), \quad \frac{\partial w}{\partial t} = \frac{b}{x^n} \frac{\partial}{\partial x} \left( x^n \frac{\partial w}{\partial x} \right) + w^k g \left( \frac{u}{w} \right).$$

Self-similar solution:

$$u = (C_1 t + C_2)^{\frac{1}{1-k}} y(\xi), \quad w = (C_1 t + C_2)^{\frac{1}{1-k}} z(\xi), \quad \xi = \frac{x}{\sqrt{C_1 t + C_2}},$$

where  $C_1$  and  $C_2$  are arbitrary constants, and the functions  $y = y(\xi)$  and  $z = z(\xi)$  are determined by the system of ordinary differential equations

$$\begin{aligned} a \xi^{-n} (\xi^n y'_\xi)'_\xi + \frac{1}{2} C_1 \xi y'_\xi + \frac{C_1}{k-1} y + y^k f(y/z) &= 0, \\ b \xi^{-n} (\xi^n z'_\xi)'_\xi + \frac{1}{2} C_1 \xi z'_\xi + \frac{C_1}{k-1} z + z^k g(y/z) &= 0. \end{aligned}$$