Rapid Mix Research

An economical hydraulic mixer that generates energy dissipation rates in excess of 1 W/kg can be designed using a simple inline orifice. The orifice must be downstream from the aluminum sulfate injection point and upstream from the flocculator. The maximum energy dissipation rate in the jet issuing from the orifice can be estimated by the equation

$$\varepsilon_{max} \cong \frac{0.31 (V_{jet})^3}{D_{jet}}$$

where the velocity is the actual average fluid velocity in the vena contracta and jet diameter is the diameter of the vena contracta. This equation can be obtained by evaluating the energy dissipation rate at 8d, the limit of applicability of the equation found in THE INFLUENCE OF VISCOSITY ON MIXING IN JET REACTORS by Jo BALDYGA, J. R. BOURNE* and R. V. GHOLAP.