

21 Most Influential Contributions to Mixing Research

(in chronological order)

A list compiled on the occasion of the 21st Anniversary of NAMF's formal affiliation with AIChE based on votes from Mixing Award winners around the world.

Published by NAMF council, October, 2011.

1. Kolmogoroff, A. N.

The local structure of turbulence in incompressible viscous fluid for very large Reynolds numbers, *Compt. Rend. Acad. Sci. USSR*, **30**, 301–305 (1941a).

Dissipation of energy in locally isotropic turbulence, *Compt. Rend. Acad. Sci. USSR*, **32**, 16–18 (1941b).

2. Rushton, J. H.

Rushton, J.H., Costich, E. W. and Everett, H. J., Power characteristics of mixing impellers, *Chem. Eng. Progr.* 46, 395-404, (1950) and; 46, 467-79, (1950).

3. Danckwerts, P.V.

Danckwerts, P. V., Continuous systems: distribution of residence times. *Chem. Eng. Sci.* **2**, 1 – 13 (1953)

Danckwerts, P.V., The effect of incomplete mixing on homogeneous reactions, *Chem. Eng. Sci.*, **8**, 93-99 (1958).

4. Hinze, J. O.

Hinze, J. O., Fundamentals of the hydrodynamic mechanism of splitting in dispersion process, *AIChE J.* **1**, 289-295 (1955).

5. Metzner, A. B. and Otto R. E.

Metzner, A. B. and R. E. Otto, Agitation of non-Newtonian fluids, *AIChE J.* **3**, 3-10 (1957).

6. Zwietering, T.N.

Zwietering, T.N., Suspending of solid particles in liquid by agitators, *Chem. Eng. Sci.*, **8**, 244-253, (1958).

7. Toor, H.L.

Toor, H.L., Mass transfer in dilute turbulent and non- turbulent systems with rapid irreversible reactions and equal diffusivities. *AIChE J.*, **8**, 70-78, (1962).

8. Corrsin S.

Corrsin S., ‘The isotropic turbulent mixer: II. Arbitrary Schmidt number’ *AIChE J.* **10**, 870-877 (1964).

9. Cutter, L.A.

Cutter, L. A., Flow and turbulence in stirred tank. *AIChE J.* **12**, 35 – 44 (1966).

10. Van't Riet and K., Smith, J.M.

Van't Riet, K., Smith, J.M., The trailing vortex system produced by Rushton turbine agitators, *Chem Eng. Sci.* **30**, 1093-1105 (1975).

11. Coualoglou , C. A. and Tavlarides L. L.

Coualoglou , C. A., and Tavlarides L. L., Description of interaction process in agitated liquid-liquid dispersion, *AIChE J.* **32**, 1289-1297 (1977).

12. Grace, H.P.

Grace, H.P., Dispersion phenomena in high viscosity immiscible fluid systems and application of static mixers as dispersion devices in such systems, *Chem. Eng. Commun.*, **14**, 225-227, (1982).

13. Calabrese, R. V. et al.

Calabrese, R.V., Chang, T.P.K., and Dang, P.T., Drop Breakup in Turbulent Stirred Tank Contactors”, Part I: “Effect of Dispersed Phase Viscosity, *AIChE J.*, **32**, 657-666 (1986)
(with Part II and Part III also voted)

14. Davies, J. T.

Davies, J. T., A physical interpretation of drop sizes in homogenizers and agitated tanks, including the dispersion of viscous oils, *Chem. Eng. Sci.*, **42**, 1671-1676 (1987).

15. Nienow, A.W. et al.

Elson, T.P., Cheesman D.J., and Nienow A.W., X-ray studies of cavern sizes and mixing performance with fluids possessing a yield stress, *Chem. Eng. Sci.*, **41**, 2555-2562 (1987).
(with 4 other papers by Nienow voted)

16. Yianneskis, M. et al.

Yianneskis, M., Popiolek, Z., and Whitelaw, J.H., An experimental study of the steady and unsteady flow characteristics of stirred reactors, *J. Fluid Mech.*, **175**, 537-555 (1987).

17. Kresta S. M. and Wood, P.E.

Kresta, S.M. and Philip E.Wood, Prediction of the three-dimensional turbulent flow in stirred tanks, *AIChE J.*, **37**, 448-460 (1991).

Kresta, S.M. and Philip E.Wood, The flow field produced by a pitched blade turbine – characterization of the turbulence and estimation of the dissipation rate, *Chem. Eng. Sci.*, **48**, 1761 – 1774 (1993).

18. Derksen J. and Van den Akker HEA

Derksen J. and Van den Akker HEA, Large eddy simulations on the flow driven by a Rushton turbine, *AIChE J.*, **45**, 209-221 (1999).

19. Ottino, J.M.

The Kinematics of Mixing: Stretching, Chaos, and Transport, Ottino, J. M., Cambridge Texts in Applied Mathematics, 1989 and 1997.

20. Bourne, J. R. and Baldyga, J.

Turbulent Mixing and Chemical Reactions, Baldyga, J. and Bourne, J. R., John Wiley & Sons, 1999.
Bourne, J. R., Mixing on the molecular scale, *Chem. Eng. Sci.*, **38**, 5-8 (1983).
(with 5 other papers by Bourne and/or Baldyga also voted)

21. NAMF

Handbook of Industrial Mixing, edited by E.L., Paul, V.A, Atiemo-Obeng S. M. Kresta, Wiley-Interscience (2004).