Appendix: Notation

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| **Spatial quantities** | |
| *x,y,z* | Cartesian co-ordinates [L] |
| *t* | Time since the experiment began [T] |
| *ξ , η , ζ , τ* | Dummy variables corresponding to regular independent variables (x,y,z,t) |
| *T* | Time variable |
| *X* | Space variable |
|  |  |
|  |  |
| **Source geometry quantities** | |
| *A* | (Length of pollutant along y-direction)/*2* [L] |
| *W* | Width of source [L] |
| *H* | Thickness of source [L] |
| *H* | Injection width |
|  | Length of aquifer |
| *W´* | Domain width |
| *X´* | x-x0 |
| *Y* | (non dimensional) |
|  | *2Y* |
| *L* | Plume length |
| *X,Y* | and respectively - Chen et al (2016) |
|  |  |
|  |  |
| **Chemical reaction quantities** | |
| *ED* | Electron donor |
| *EA* | Electron acceptor |
|  | Initial source conc. of the species at the origin (at *x=x0*) |
|  | Initial conc. of electron donor |
| *Ci* | Conc of species i [ML-3] |
|  | Volume-averaged (resident) conc. (Batu and Van genuchten, 1990) |
| *C’* | *C/C0* |
| *λ´i* | A constant |
|  | *0, (π/8) , (2π/8), , , , , π* |
| *λ1* | */(a+y)* |
| *λ2* | */(a-y)* |
| *C0* | Initial conc. of solute (source conc.) (at *x=x0*) |
| *µ* | First order degradation factor |
| *λ* | Decay constant |
| *ki* | First-order decay rate constant of species i [T-1] |
| *yi* | The effective yield factor that describes the mass of a species i produced from species i-1 [MM-1] |
| *K* | *k\*/ De* |
| *Inverf()* | Inverse error function |
| *U* | non dimensional |
| *T´* | - chen et al (2016) |
|  | - chen et al (2016) |
|  | -chen et al (2016) |
|  | -chen et al (2016) |
|  | Eigen value |
| *λm* | Source decay constant [T-1] |
|  | First order decay term [T-1] - Sanskrityayn et al. (2017) |
| *, & g* | Non-dimensional expressions in (mt) - Sanskrityayn et al. (2017) |
| *M* | Injected pollute mass [ML-2] - Sanskrityayn et al. (2017) |
| *a* | Parameter for spatial dependence [L-1] - Sanskrityayn et al. (2017) |
| *m* | Parameter for temporal dependence [T-1] - Sanskrityayn et al. (2017) |
| *a´ & b´* | *a* [T-1]and *b* [LT-1]are so chosen such that - Subhrangshu Purkayastha & Bimlesh Kumar (2020) |
| *D´0* | *a´2* - Subhrangshu Purkayastha & Bimlesh Kumar (2020) |
| *v´0* | *a´-a´2* - Subhrangshu Purkayastha & Bimlesh Kumar (2020) |
| *λ* | *a +*  - Subhrangshu Purkayastha & Bimlesh Kumar (2020) |
|  |  |
| **Process quantities** | |
| *α* | Dispersivity [L] |
| *αx* | Longitudinal dispersivity [L] |
| *αy* | Transverse horizontal dispersivity |
| *αz* | Transverse vertical |
| *u* | Groundwater vel in x-direction |
| *u0* | Initial ground water velocity in x-direction |
|  | Initial ground water velocity in y-direction |
| *w* | Downward pore water velocity (z-direction) |
| *Dx* | Dispersion coeff. in x-direction |
| *Dz* | Transverse dispersion coeff. |
| *D0* | α u0 ( initial dispersion coeff.) [L2T-1] |
| *R* | Solute retardation factor |
| *De* | Effective coeff. of molecular diffusion[L2T-1] |
| *K* | Transfer coeff. [L-1] |
| *K\** | Mass transfer parameter [LT-1] |
| *Γ* | *k\*C0/ De* [ML-4] |
| *g(τ)* | A function [ML-3] |
| *τ* | A parameter |
|  | Dimensionless [-] |
| *&* | Auxiliary functions |
|  |  |