$$\hat{H}\left(r, R\right) = -\frac{1}{2} \sum_{i=1}^{N} \nabla_i^2 - \frac{1}{2} \sum_{I=1}^{M} \frac{1}{A_I} \nabla_I^2 + \sum_{i=1}^{N} \sum_{j>i}^{N} \frac{1}{\left|r_i - r_j\right|}$$
$$- \sum_{i=1}^{N} \sum_{I=1}^{M} \frac{Z_I}{\left|r_i - R_I\right|} + \sum_{I=1}^{M} \sum_{J>I}^{M} \frac{Z_I Z_J}{\left|R_I - R_J\right|}$$