The full version of recursion formulae (17) in the article "Electrophoresis of a colloidal sphere parallel to a dielectric plane" by H. J. Keh & S. B. Chen, published in *J. Fluid Mech.* 194, 377-390 (1988).

$$A_n = 0 \tag{a}$$

$$\frac{(n+2)(n+3)}{2n+3} G_{n+1} + \frac{1}{2n+3} E_{n+1} - \frac{(n-1)(n-2)}{2n-1} G_{n-1} - \frac{1}{2n-1} E_{n-1}$$
$$= \frac{\epsilon \zeta_w E_\infty}{4\pi\eta} \left[\frac{2n+4}{2n+3} S_{n+1} - 2 S_n + \frac{2n-2}{2n-1} S_{n-1}\right] \tag{b}$$

$$\frac{(n+2)(n+3)}{2n+3} \left\{ G_{n+1} \cosh(n+\tfrac{3}{2})\xi_p + H_{n+1} \sinh(n+\tfrac{3}{2})\xi_p \right\}$$
$$- \frac{(n-2)(n-1)}{2n-1} \left\{ G_{n-1} \cosh(n-\tfrac{1}{2})\xi_p + H_{n-1} \sinh(n-\tfrac{1}{2})\xi_p \right\}$$
$$- \frac{1}{2n-1} \left\{ E_{n-1} \cosh(n-\tfrac{1}{2})\xi_p + F_{n-1} \sinh(n-\tfrac{1}{2})\xi_p \right\}$$
$$+ \frac{1}{2n+3} \left\{ E_{n+1} \cosh(n+\tfrac{3}{2})\xi_p + F_{n+1} \sinh(n+\tfrac{3}{2})\xi_p \right\}$$
$$= \frac{\epsilon \zeta_p E_\infty}{4\pi\eta} \left\{ \frac{2n+4}{2n+3} S_{n+1} \cosh(n+\tfrac{3}{2})\xi_p - 2 S_n \cosh \xi_p \cosh(n+\tfrac{1}{2})\xi_p \right.$$
$$+ \frac{2n-2}{2n-1} S_{n-1} \cosh(n-\tfrac{1}{2})\xi_p + \frac{2\sqrt{2}}{2n-1} \exp[-(n-\tfrac{1}{2})\xi_p]$$
$$\left. - \frac{2\sqrt{2}}{2n+1} \exp[-(n+\tfrac{3}{2})\xi_p] \right\} \tag{c}$$

$$C_n + \frac{n-1}{2n-1} C_{n-1} + \frac{n+2}{2n+3} C_{n+1} + \frac{1}{2n-1} E_{n-1} - \frac{1}{2n+3} E_{n+1} +$$
$$\frac{(n+2)(n+3)}{2n+3} G_{n+1} - \frac{(n-1)(n-2)}{2n-1} G_{n-1}$$
$$= \frac{\epsilon \zeta_w E_\infty}{4\pi\eta} \left\{ - \frac{4n^2+4n-6}{(2n-1)(2n+3)} S_n + \frac{(n-1)(n-2)}{2n-1} S_{n-2} - \frac{2(n-1)^2}{2n-1} S_{n-1} \right.$$
$$\left. + \frac{2(n+2)^2}{2n+3} S_{n+1} - \frac{(n+2)(n+3)}{2n+3} S_{n+2} \right\} \tag{d}$$

$$C_n \cosh(n+\tfrac{1}{2})\xi_p + D_n \sinh(n+\tfrac{1}{2})\xi_p + \frac{2\cosh \xi_p}{\sinh \xi_p} B_n \sinh(n+\tfrac{1}{2})\xi_p$$

$$- \frac{2}{\sinh \xi_p} \frac{n-1}{2n-1} B_{n-1} \sinh(n-\tfrac{1}{2})\xi_p - \frac{2}{\sinh \xi_p} \frac{n+2}{2n+3} B_{n+1} \sinh(n+\tfrac{3}{2})\xi_p$$

$$= \frac{\epsilon \zeta_p E_\infty}{4 \pi \eta} \Big\{ - \frac{4n^2 + 4n - 6}{(2n-1)(2n+3)} S_n \cosh(n+\tfrac{1}{2})\xi_p$$

$$+ \frac{(n-2)(n-1)}{2n-1} S_{n-2} \cosh(n-\tfrac{3}{2})\xi_p - 2 \cosh \xi_p \frac{(n-1)^2}{2n-1} S_{n-1} \cosh(n-\tfrac{1}{2})\xi_p$$

$$+2 \cosh \xi_p \frac{(n+2)^2}{2n+3} S_{n+1} \cosh(n+\tfrac{3}{2})\xi_p - \frac{(n+2)(n+3)}{2n+3} S_{n+2} \cosh(n+\tfrac{5}{2})\xi_p$$

$$+2^{5/2} \cosh \xi_p \left[\frac{n-1}{2n-1} \exp[-(n-\tfrac{1}{2})\xi_p] + \frac{n+2}{2n+3} \exp[-(n+\tfrac{3}{2})\xi_p] \right]$$

$$- 2^{5/2} \exp[-(n+\tfrac{1}{2})\xi_p] \Big\} \qquad \text{(e)}$$

$$\frac{2n(n+1)}{(2n-1)(2n+3)} \left\{ C_n \cosh(n+\tfrac{1}{2})\xi_p + D_n \sinh(n+\tfrac{1}{2})\xi_p \right\}$$

$$- \frac{(n+2)(n+3)}{(2n+3)(2n+5)} \left\{ C_{n+2} \cosh(n+\tfrac{5}{2})\xi_p + D_{n+2} \sinh(n+\tfrac{5}{2})\xi_p \right\}$$

$$- \frac{(n-2)(n-1)}{(2n-3)(2n-1)} \left\{ C_{n-2} \cosh(n-\tfrac{3}{2})\xi_p + D_{n-2} \sinh(n-\tfrac{3}{2})\xi_p \right\}$$

$$- \frac{1}{(2n-1)(2n+3)} \left\{ E_n \cosh(n+\tfrac{1}{2})\xi_p + F_n \sinh(n+\tfrac{1}{2})\xi_p \right\}$$

$$+ \frac{n+2}{(2n+3)(2n+5)} \left\{ E_{n+2} \cosh(n+\tfrac{5}{2})\xi_p + F_{n+2} \sinh(n+\tfrac{5}{2})\xi_p \right\}$$

$$- \frac{\cosh \xi_p}{2n+3} \left\{ E_{n+1} \cosh(n+\tfrac{3}{2})\xi_p + F_{n+1} \sinh(n+\tfrac{3}{2})\xi_p \right\}$$

$$+ \frac{\cosh \xi_p}{2n-1} \left\{ E_{n-1} \cosh(n-\tfrac{1}{2})\xi_p + F_{n-1} \sinh(n-\tfrac{1}{2})\xi_p \right\}$$

$$- \frac{n-1}{(2n-3)(2n-1)} \left\{ E_{n-2} \cosh(n-\tfrac{3}{2})\xi_p + F_{n-2} \sinh(n-\tfrac{3}{2})\xi_p \right\}$$

$$- \frac{3(n-1)(n+2)}{(2n-1)(2n+3)} \left\{ G_n \cosh(n+\tfrac{1}{2})\xi_p + H_n \sinh(n+\tfrac{1}{2})\xi_p \right\}$$

$$- \frac{(n+2)(n+3)(n+4)}{(2n+3)(2n+5)} \left\{ G_{n+2} \cosh(n+\tfrac{5}{2})\xi_p + H_{n+2} \sinh(n+\tfrac{5}{2})\xi_p \right\}$$

$$+ \cosh \xi_p \frac{(n+2)(n+3)}{2n+3} \left\{ G_{n+1} \cosh(n+\tfrac{3}{2})\xi_p + H_{n+1} \sinh(n+\tfrac{3}{2})\xi_p \right\}$$

$$- \cosh \xi_p \frac{(n-1)(n-2)}{2n-1} \left\{ G_{n-1} \cosh(n-\tfrac{1}{2})\xi_p + H_{n-1} \sinh(n-\tfrac{1}{2})\xi_p \right\}$$

$$+ \frac{(n-3)(n-2)(n-1)}{(2n-3)(2n-1)} \left\{ G_{n-2} \cosh(n-\tfrac{3}{2})\xi_p + H_{n-2} \sinh(n-\tfrac{3}{2})\xi_p \right\}$$

$$= - \frac{\epsilon \zeta_p E_\infty}{4 \pi \eta} \Big\{ \cosh^2 \xi_p \frac{2n^2 + 2n - 6}{(2n-1)(2n+3)} S_n \cosh(n+\tfrac{1}{2})\xi_p$$

$$+ \cosh^2 \xi_p \frac{2(n+3)^2(n+2)}{(2n+3)(2n+5)} S_{n+2} \cosh(n+\tfrac{5}{2})\xi_p$$

$$- \cosh^2 \xi_p \frac{2(n-2)^2(n-1)}{(2n-3)(2n-1)} S_{n-2} \cosh(n-\tfrac{3}{2})\xi_p$$

$$+ \frac{4n^2 + 4n - 6}{(2n-1)(2n+3)} S_n \cosh(n+\tfrac{1}{2})\xi_p$$
$$+ \frac{(n+3)(n+2)}{2n+3} S_{n+2} \cosh(n+\tfrac{5}{2})\xi_p$$
$$- \frac{(n-2)(n-1)}{2n-1} S_{n-2} \cosh(n-\tfrac{3}{2})\xi_p$$
$$- \cosh\xi_p \frac{(n+2)(n+3)(n+4)}{(2n+3)(2n+5)} S_{n+3} \cosh(n+\tfrac{7}{2})\xi_p$$
$$+ \cosh\xi_p \frac{(n-3)(n-2)(n-1)}{(2n-3)(2n-1)} S_{n-3} \cosh(n-\tfrac{5}{2})\xi_p$$
$$+ \cosh\xi_p \frac{(n-1)(10n^3 - 13n^2 - 24n + 36)}{(2n-3)(2n-1)(2n+3)} S_{n-1} \cosh(n-\tfrac{1}{2})\xi_p$$
$$- \cosh\xi_p \frac{(n+2)(20n^4 + 96n^3 + 107n^2 - 42n - 37)}{(2n-1)(2n+1)(2n+3)(2n+5)} S_{n+1} \cosh(n+\tfrac{3}{2})\xi_p$$
$$+ 2^{5/2} \left[\cosh^2\xi_p \frac{2n^2 + 2n - 3}{(2n-1)(2n+3)} + 1 \right] \exp[-(n+\tfrac{1}{2})\xi_p]$$
$$+ 2^{5/2} \cosh^2\xi_p \frac{(n+3)(n+2)}{(2n+5)(2n+3)} \exp[-(n+\tfrac{5}{2})\xi_p] \quad]$$
$$-2^{7/2} \cosh\xi_p \left[\frac{n+2}{2n+3} \exp[-(n+\tfrac{3}{2})\xi_p] + \frac{n-1}{2n-1} \exp[-(n-\tfrac{1}{2})\xi_p] \right]$$
$$+ 2^{5/2} \cosh^2\xi_p \frac{(n-2)(n-1)}{(2n-3)(2n-1)} \exp[-(n-\tfrac{3}{2})\xi_p] \quad \Big\} \qquad \text{(f)}$$

$$5\, C_n - (n-1)\, C_{n-1} + (n+2)\, C_{n+1} - E_{n-1} + 2\, E_n - E_{n+1}$$
$$+ (n-2)(n-1)\, G_{n-1} - 2(n-1)(n+2)\, G_n + (n+2)(n+3)\, G_{n+1}$$
$$-2\,(n-1)\, B_{n-1} + 2(2n+1)\, B_n - 2(n+2)\, B_{n+1} = 0 \qquad \text{(g)}$$

$$5\, D_n - (n-1)\, D_{n-1} + (n+2)\, D_{n+1} - F_{n-1} + 2\, F_n - F_{n+1}$$
$$+ (n-2)(n-1)\, H_{n-1} - 2(n-1)(n+2)\, H_n + (n+2)(n+3)\, H_{n+1}$$
$$-2\,(n-1)\, A_{n-1} + 2(2n+1)\, A_n - 2(n+2)\, A_{n+1} = 0 \qquad \text{(h)}$$