

**EXAMINATION DATA SHEET FOR THE PHYSICAL SCIENCES
(CHEMISTRY)****TABLE 1 PHYSICAL CONSTANTS**

NAME	SYMBOL	VALUE
Magnitude of charge on electron	e	$1,6 \times 10^{-19} \text{ C}$
Mass of an electron	m_e	$9,1 \times 10^{-31} \text{ kg}$
Standard pressure	p^θ	$1,01 \times 10^5 \text{ Pa}$
Molar gas volume at STP	V_m	$22,4 \text{ dm}^3 \cdot \text{mol}^{-1}$
Standard temperature	T^θ	$273 \text{ K (0 } ^\circ\text{C)}$
Avogadro's constant	N_A	$6,02 \times 10^{23} \text{ mol}^{-1}$
Faraday's constant	F	$96\,500 \text{ C} \cdot \text{mol}^{-1}$

TABLE 2 CHEMISTRY FORMULAE

$n = \frac{m}{M}$	$n = \frac{N}{N_A}$	$n = \frac{V}{V_m}$
$c = \frac{n}{V}$ OR $c = \frac{m}{MV}$	$K_w = [\text{H}_3\text{O}^+] \cdot [\text{OH}^-] = 1 \times 10^{-14}$ at $25\text{ }^\circ\text{C (298 K)}$	
$q = It$ $q = nF$	$E_{\text{cell}}^\theta = E_{\text{cathode}}^\theta - E_{\text{anode}}^\theta$ $E_{\text{cell}}^\theta = E_{\text{oxidising agent}}^\theta - E_{\text{reducing agent}}^\theta$	

Physical Science P2 2014 Prelims

Albert A Gayle



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web coordinates of v the standard coordinates are v_3 are the b_1 b_2 are assumed if no other basis is specified this means $v = v_1 e_1 + v_2 e_2 + v_3 e_3$ if $\{b_1, b_2, b_3\}$ is a basis of \mathbb{R}^3 then the matrix S which contains the vectors b_k as column vectors is called the coordinate change matrix

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opposite direction antiparallel if we multiply an arbitrary vector \mathbf{a} by the inverse of its magnitude $1/a$ we obtain a

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web and now that we know what D is we can now solve for A we can now solve for the transformation matrix with respect to the standard basis so to do that we have to figure out C and C^{-1} so C remember C is just the change of basis matrix and all that is is the basis vectors it's just a matrix with the basis vectors in the column

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web a translation by a nonzero vector is not a linear map because linear maps must send the zero vector to the zero vector however translations are very useful in performing coordinate transformations i'll introduce the following terminology for the composite of a linear transformation and a translation definition let A be a real matrix

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