

CHEMISTRY Terminology

The ABCs of chemistry

A

A: Symbol for atomic mass number
absolute zero: Lowest temperature; 0 Kelvin
Ae: Symbol for the element actinium, $Z = 89$
accuracy: The closeness of measurement to true value
acetate anion: $C_2H_3O_2^-$, charge -1
acetic acid: $C_2H_4O_2$
acetone: Dimethyl ketone; organic solvent
acid-base indicator: A chemical that changes color if the pH changes
acid-base titration: A method for determining acid or base concentrations
acid definition: See Arrhenius acid, Brønsted-Lowry acid, Lewis acid
acid ionization constant (K_a): Equilibrium constant for acid dissociation
acidic solution: pH below 7
actinide: Element with $Z = 90$ or above; radioactive
activation energy (E_a): A process's energy barrier



adhesion: Attraction of unlike molecules or materials
Ag: Symbol for the element silver, $Z = 47$
Al: Symbol for the element aluminum, $Z = 13$
alcohol: Organic compound with -OH group; ROH
aldehyde: Carbonyl group bonded to hydrogen and an organic group
alkali metal family: Lithium, sodium, potassium, rubidium, cesium, and francium; column #1
alkaline earth metal family: Beryllium, magnesium, calcium, strontium, barium, and radium; column #2
alkane: Hydrocarbon; all C-C single bonds
alkene: Hydrocarbon; 1 or more C=C double bonds
alkyne: Hydrocarbon; 1 or more C≡C triple bonds
allotropes: Two or more forms of an element
alloy: Solution of 2 or more metals
alpha (α): Greek letter that denotes radioactive particle and various scientific variables
alpha particle: Helium nucleus; charge +2
Au: Symbol for the element auriferous, $Z = 79$
amalgam: Alloy of mercury with other metal
amine: Organic base; RRRN; modified ammonia
amino acid: Compound with organic acid and organic base property; forms proteins and peptides
ammonia: NH_3 , base
ammonium cation: NH_4^+ , charge +1
ammonium hydroxide: NH_4OH
amphoteric oxide: Exhibits both acid and basic properties
amu: Atomic mass unit; $1/12$ mass of C-12
anion: Ion with a negative charge
anode: Electrode that supports oxidation
antibonding MO: MO is less stable than separate AOs
AO: Abbreviation for atomic orbital

aq: Aqueous; "dissolved in water"
Ar: Symbol for the element argon, $Z = 18$
aromatic: Organic compound with a benzene ring
Arrhenius acid: Produces hydronium ion in water solution
Arrhenius base: Yields hydroxide ion in water solution
Arrhenius equation for rate constant (k):

$$k = Ae^{-E_a/RT}$$
 E_a = activation energy
arsenide anion: As^{3-} , charge -3
As: Symbol for the element arsenic, $Z = 33$
At: Symbol for the element astatine, $Z = 85$
atm: Symbol for pressure in "atmospheres"
atom: Fundamental unit of all matter
atomic mass number (A): Total number of protons and neutrons
atomic number (Z): Number of protons in the nucleus
atomic orbital: Wave motion of electrons in atoms
atomic radius: Empirical measure of atom size
atomic weight: Weighted average of natural isotopes of an element
Au: Symbol for the element gold, $Z = 79$
Aufbau principle: Guides the filling of electronic subshells of the elements
Avogadro's law: Volume is proportional to gas moles at fixed pressure and temperature
Avogadro's number: $N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$

Bk: Symbol for the element berkelium, $Z = 97$
bleach: Chemical that is a strong oxidizing agent
boiling: Liquid $\rightarrow$ gas at the boiling point
boiling point elevation: A solution has a higher boiling point than a pure solvent
boiling point (T_b): Liquid-gas equilibrium, $P = 1 \text{ atm}$
boiling point of water: 100°C
bond energy: Energy held by a chemical bond
bond length: Distance between 2 atoms in a bond
bond order for Lewis model: # of bonds divided by # of bonded atoms
bond order for MO treatment: # of filled bonding MOs minus # of filled antibonding MOs
bonding electrons: Form chemical bonds in a compound
bonding MO: MO is more stable than AOs
Boyle's law: PV constant for gas, fixed T and n
Br: Symbol for the element bromine, $Z = 35$
bromide anion: Br^- , charge -1
Brønsted-Lowry acid: Proton donor
Brønsted-Lowry base: Proton acceptor
buffer: Composed of weak acid and weak base; serves to keep pH constant



B

B: Symbol for the element boron, $Z = 5$
Ba: Symbol for the element barium, $Z = 56$
balanced equation: Each side of the equation has the same number of atoms of each element and charge
balanced redox: Electron loss = electron gain
barium cation: Ba^{2+} , charge +2
base definition: See Arrhenius base, Brønsted-Lowry base, Lewis base
base ionization constant (K_b): Equilibrium constant for base dissociation
basic solution: pH over 7
battery: Source of electrical power; galvanic cell
Be: Symbol for the element beryllium, $Z = 4$
benzene: C_6H_6 ; organic solvent; aromatic ring of 6 carbon atoms
beryllium cation: Be^{2+} , charge +2
beta (β): Greek letter that denotes radioactive particle and a number of scientific variables
beta particle: Energetic electron from the nucleus; charge -1
Bh: Symbol for the element bohrium, $Z = 107$
Bi: Symbol for the element bismuth, $Z = 83$
bicarbonate anion: HCO_3^- , charge -1
bimolecular oxygen: O_2
binary compound: Formed from 2 elements
bisulfate anion: HSO_4^- , charge -1



b: Symbol for centi- , the SI prefix for $1/100$ or 10^{-2}
c: Symbol for the speed of light
°C: Celsius temperature scale
C: Symbol for the element carbon, $Z = 6$
 $C_2H_4O_2$: Acetic acid
Ca: Symbol for the element calcium, $Z = 20$
calcium cation: Ca^{2+} , charge +2
calcium fluoride: CaF_2
calcium hydroxide: $Ca(OH)_2$
calorie: English unit of heat energy
calorimetry: Study of the release or absorption of heat
carbide anion: C^{4-} , charge -4
carbohydrate: Organic compound; carbon bonded to several -OH groups (sugar and starch)
carbon dioxide: CO_2
carbon monoxide: CO
carbonate anion: CO_3^{2-} , charge -2
carbonic acid: H_2CO_3
carbonyl group: CO , ligand complex
carboxyl group: $>CO$ bonded to 2 groups
carboxylic acid: Organic acid; $R-COOH$
catalyst: Accelerates a reaction but is not consumed in the reaction; lowers the activation energy
cathode: Electrode that supports reduction
cation: Ion with a positive charge
Cd: Symbol for the element cadmium, $Z = 48$



Thermal Chemistry Study Guide

Neil E. Schore



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web the scale up of 3d printing technologies for biomaterials will require careful design of clean manufacturing environments both inside and outside the 3d printing platforms to ensure the avoidance of material contamination and related possible infections

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web accessibility 3 dimensional printing and bio based materials in global health an interventional approach to addressing healthcare disparities in low and middle income countries krish william ramadurai a thesis in the field of biology for the degree of master of liberal arts in extension studies

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web v ir i v r as you can see in this circuit diagram we use an r1 load resistor to convert current into voltage in this circuit a voltage divider is used but we can also use an operational amplifier to step down the voltage across the load resistor how to measure the secondary side current of ct

adc how to read high voltages on microcontroller electrical - Jan 08 2023

web you mean with a microcontroller the impedance note about analog sources probably means that if the sources are higher than 2.5k the input on the pic will start to load them down you usually want a source impedance to be at least ten times smaller than the load impedance so that it is not disturbed by the load impedance

pic voltage measurement electrical engineering stack exchange - Mar 10 2023

web pic voltage measurement ask question asked 13 years 9 months ago modified 13 years 9 months ago viewed 3k times 10
i am running a battery powered device and would like my microcontroller pic to report on the supply voltage this is so i can determine how many batteries is used in the supply and also the state of charge of the battery pack

true dc rms meter using core independent peripherals on 8 bit pic - Dec 27 2021

web this technical brief demonstrates a solution for measuring the true dc rms of a periodic dc waveform using the core independent peripherals cips that are found on the pic18 microcontrollers the project uses less code and cpu cycles since the averaging operation frequency calibration and data transfer are implemented using the cips

pic based digital voltmeter dvm embedded lab - Feb 26 2022

web the pic micro reads the input voltage through one of the 8 analog channels and convert it to a 10 bit digital number using the internal adc doing some math with adc conversion you will see later this number can be converted to the actual measured voltage the voltage is displayed in an hd44780 based character lcd

voltmeter and ammeter using pic microcontroller electrosome - Jul 02 2022

web may 20 2012 adc module of pic microcontroller converts the signals on its analog pin to 10 bit binary data and it has software selectable high and low voltage reference input to some combination of vdd vss ra2 and ra3 the analog input to pic is limited to vss and vdd voltages 0 5v of pic this circuit is designed to measure 0 to 30v

ac voltage measurement using pic16f877a microcontroller - Jul 14 2023

web jun 27 2017 so we see that there are some parameters of ac voltage such as peak voltage rms voltage line frequency wave shape etc in this project we will not measure the wave shape we will measure the peak voltage rms voltage and line frequency to make the project easy and understandable

ac voltage measurement using pic18f46k22 microcontroller - Apr 11 2023

web jul 12 2022 this pic mcu project shows how to measure ac voltage up to 500v using pic18f46k22 8 bit microcontroller the rms effective value of the voltage under measure is sent to pc which can be printed on any serial monitor software and also displayed on 16 2 lcd screen

ac power measurement meter using pic microcontroller elprocus - Jun 01 2022

web the ac voltage measurement using a pic microcontroller can be done using a difference amplifier or potential transformer the difference amplifier or potential transformer is used to step down the voltage and then by using an analog to digital converter or rectifier the voltage reading is displayed on the lcd display

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web oct 6 2018 the ac voltage measurement using pic microcontroller can be done using a difference amplifier or potential transformer the difference amplifier or potential transformer is used to step down the voltage and then by using analog to

digital converter or rectifier the voltage reading is displayed on lcd display

digital voltmeter using 7 segment display and pic microcontroller - Feb 09 2023

web digital voltmeter with 7 segment display circuit diagram a picture below shows the circuit diagram of dc voltmeter with four digit seven segment display and voltage divider circuits interfacing with pic16f877a microcontroller but you can use any other pic microcontroller also

measure pic s own vdd in voltage with adc - Mar 30 2022

web mar 19 2015 i ve just made and succesfully tested code to measure the voltage on an4 analog pin now i want to try something else not quite sure if it s theoretically possible my test board has a pic processor with vdd avdd connected to a supply ranging from 0 if the battery is empty disconnected to 4.2 full battery

ac voltage measurement using pic microcontroller youtube - Sep 04 2022

web ac voltage measurement using pic microcontroller in this video lecture you will learn about ac voltmeter design circuit using current transformer and difference amplifier how to use show

ac voltage measurement using pic microcontroller two methods - Aug 15 2023

web jul 30 2023 the diagram below shows the simulation results of an ac voltage measurement project the lcd displays a reading of 220 volts ac which is measured using a microcontroller and the necessary components connected to it including a potential transformer how to measure ac voltage using pic microcontroller

microcontroller how do i measure a negative voltage with a adc - Nov 06 2022

web i am working with a pic micro controller with inbuilt 10bit adc and want to measure a voltage in the range of 1 to 3volts i thought of using an op amp in the inverting mode to make voltage positive and then feed it to the adc of the microcontroller however here i would have to power the opamp with a negative power supply right

voltage measurement with a pic microcontroller michigan state - Jun 13 2023

web the pic18f4520 is a 40pin microcontroller with numerous functions and applications one of its many functions is analog to digital conversion through this the pic is capable of reading an analog voltage and turning it into a digital readout that can be used in a program the circuitry and code required to create a basic voltage sensor is minimal

how to measure battery voltage from a microcontroller - Aug 03 2022

web apr 25 2016 my answer would be get a shunt type reference for a voltage that is lower than the battery range of interest let s assume a 5v battery and a tl431 or the like as 2.5v reference now measure the tl431 voltage using the battery as reference assume a 10 bit a/d most common that reads n now you know that n battery 1023/2.5

three phase voltage measurement using pic microcontroller - Apr 30 2022

web the circuit diagram of three phase voltage measurement system is given below as you can see in the circuit diagram we

are using three phase generator and the voltage of each phase is measuring with the same circuit phase one phase two and phase three measurement circuit are the same

how to measure mains ac voltage with an adc from a microcontroller - Oct 05 2022

web jul 6 2016 i want to measure the mains voltage 230v 50hz using an adc channel from a microcontroller this is my current approach below i have two schematics that add two voltages one direct one alternating added to that the both the ac and dc signals are going through voltage divider but that isn t important

digital voltmeter using pic microcontroller project and circuit - May 12 2023

web digital voltmeter using pic microcontroller in this project a digital voltmeter using pic microcontroller is designed digital voltmeter using a pic can read the voltage from 0 40 volt this voltmeter can read only dc voltage digital ac voltmeter can also be designed using microcontrollers