hello students and all viewers i am miss
priyanka fernandes
assistant professor at saint josepha's
college karthalim
this is paper code chd 101
paper title dse basic topics
in analytical chemistry
we have already begun with the unit
title quantitative analysis
in this video we will be looking at
module number 14
namely post precipitation and digestion
two processes very vital for gravimetric
analysis
this module is going to cover post
precipitation
its process additional features and its
effects
a comparison will be done between post
precipitation
and precipitation we will also be
looking at digestion
its process along with methods employed
well as a student you will be able
to describe the process of post
precipitation
with an example at the end of the module
you will also be able to draw
comparative study
of post precipitation and something you
have studied in the previous module
that is co-precipitation and finally
you will also be able to provide a
detailed description
of the process of digestion
well when you begin with gravimetric
analysis
the first step is that of simple
precipitation
now if after this process we still have
certain impurities left behind
then what is noticed is a process known
as post precipitation
so post precipitation is a process which
occurs on the surface
of the first precipitate hence can also
be called

as an adsorption phenomena
now in the graph here you will notice
that as time
increases the process of post
precipitation
also increases linearly
a three-step mechanism to describe this
process is one
where the precipitating agent
precipitates out
the analyte ion well this same
precipitating agent now goes on
to precipitate the other ions and this
very step
of precipitating the other ions or
rather the impurity
is called as post precipitation
before we move into looking at an
example let us first
understand that post precipitation
involves
sparingly soluble substances which
further form a supersaturated solution
now these substances have a common ion
with that of the first precipitate that
is a common ion effect
something you might already be
acquainted with
an example here is that of magnesium
oxalate which is present
in calcium oxalate solution
for better understanding you can take a
look at this diagram
we have calcium oxalate precipitate and
then you have the common ion which is
the oxalate ion
c2o4 2 minus this oxalate ion acts as
the primary layer
now we see the impurity which is
magnesium
mg2 plus acting as a second layer
which goes on the first layer
of oxalate hence in such a solution
the magnesium separates or precipitates
out
gradually on the surface of calcium
oxalate

what are the features well the rate of
the reaction
of post precipitation is much more
slower as compared to that of simple
precipitation now the particles of the
primary precipitate
they act as the nuclei for the post
precipitation
of the impurity from the saturated
solution
now remember that post precipitation
always gives a positive error
meaning that the amount of precipitate
formed in the case of post precipitation
is more than that of simple
precipitation
let us now look at a comparison between
post precipitation
and co-precipitation in the first case
we see that the contamination in the
case of post precipitation
increases with the precipitate when it
is left in contact with the mother
liquor
while on the other hand the
contamination decreases with time in the
case of postpress of co-precipitation
contamination increases with increase
also
in the rate of agitation either
mechanically by stirring
or thermally by heating in the case of
post precipitation
in co precipitation on agitation there
is no
increase in the
contamination we see that in post
precipitation
of course the magnitude of contamination
is much
greater than that of co-precipitation
so it is but obvious that this process
of post precipitation
is highly undesirable so how can it be
prevented
these are the following steps either the
precipitate

can be filtered quickly or the process
of digestion can be employed
[Music]
further after simple precipitation a
re-precipitation step can be carried out
and lastly a glass piece can also be
added to act as
nucleus for the impurities
so we have come across the word
digestion now what is digestion
when we see that impurities can also be
present in the form
of colloidal particles having a very
very small size
ranging from 10 to 2000 angstrom
hence these particles being small in
size can easily
pass through the porous filter paper
since they are soluble
hence the objective of digestion is to
remove
the filterability of this precipitate
which ensures the complete precipitation
which can readily be filtered now
digestion of course decreases the number
of colloidal particles
and how does it do this it does this by
the process
of oswald ripening
now in the previous module itself you
might have understood that
as the growth of the nuclei decreases
and the formation of the nuclei
increases the nuclei become
larger in size now this is highly
desired right
because if the nuclei is larger in size
it will easily stick to the pores of the
filter paper
and it will get readily filtered hence
this oswald ripening by the name itself
we can understand
that the particles grow larger in size
once they grow larger in size
the impurities of colloidal particles
can easily be
filtered out so what is this digestion

process
digestion is usually carried out by
allowing the precipitate to remain in
contact with the mother liquor
at highly elevated temperatures the
smaller particles then will exhibit
higher solubility they tend to dissolve
and they make the solution
supersaturated to the larger particles
hence we need to maintain this solution
equilibrium
and this is done when the material
deposits on the larger particles
hence in other words you can say that
the larger particles grow
on the expense of the smaller particles
which is exactly what happens in
oswald ripening now digestion can be
employed by two methods
either by method one the liquid can be
heated and then
cooled which on cooling your colloidal
particles will get absorbed
on the nuclei of the precipitate or by
the second method the liquid can be kept
still and standing for 12 to 24 hours
with this the colloidal particles will
then be absorbed
on the surface of the precipitate
well these are my references thank you