

## Data Nickel and Cobalt Compounds

Reference numbers match the experiment

### 1. $\text{Co}(\text{Ph}_3\text{PO})_2(\text{NO}_3)_2$

Conductance in nitromethane: 7.4 (ref. 9); 36 (this work)  
nonelectrolyte

Magnetic moment: 4.69 (ref. 9); 4.61 (this work)

Crystal structure: octahedral with bidentate nitrates (ref. 10)

Melting point: 246 (ref. 9); 249-250 (this work)

IR combination bands: 1716 and 1766 (this work)  
bidentate nitrate

Result: octahedral Ni

### 2. $\text{Ni}(\text{en})_2(\text{NO}_3)_2$

Conductance in nitromethane: 38 (this work)  
nonelectrolyte

Magnetic moment: 3.06 (ref 7); 2.91 (this work)

IR combination bands: 1741 and 1762 (ref. 7)  
1740 and 1767 (this work)

monodentate nitrate

Result: octahedral nitrate

### 3. $\text{Ni}(\text{en})_2(\text{NO}_3)\text{I}$

Conductance: not soluble in suitable solvent

Magnetic moment: 2.96 (this work)

IR combination bands: 1728 and 1773 (ref. 7)  
1726 and 1767 (this work)

bidentate nitrate

Thus ionic  $\text{I}^-$

Result: octahedral nickel

### 4. $\text{Co}(\text{NH}_3)_4(\text{CO}_3)(\text{NO}_3)$

Conductance in water: 127 (this work)  
1:1 electrolyte; ionic nitrate

Magnetic moment: diamagnetic (this work)

IR combination bands: 1768 (this work)

IR carbonate bands: bidentate carbonate

Result: octahedral cobalt

### 5. $\text{Ni}(\text{Ph}_3\text{P})_2(\text{NO}_3)_2$

Conductance in nitromethane: 32 (this work)

nonelectrolyte (ref. 6)  
Melting point: 224-227 (ref. 6)  
Magnetic moment: 3.04 (ref. 6)  
IR combination bands: 1772 and 1797 (this work)  
monodentate nitrate  
Result: tetrahedral nickel

#### 6. $\text{Ni}(\text{Ph}_3\text{P})_2(\text{SCN})_2$

Conductance in acetonitrile: 40 (this work)  
nonelectrolyte (ref. 6)  
Magnetic moment: diamagnetic (ref. 6)  
square planar nickel  
Melting point: 217-218 (ref. 6)  
IR: 2077 and no band at 480  
sulfur bonding  
Result: square planar nickel

#### 7. $\text{Ni}(\text{py})_3(\text{NO}_3)_2$

Conductance in nitromethane: 7.25 (ref. 11); 6.45 (ref. 15); 12 (ref. 12)  
nonelectrolyte  
Magnetic moment: 3.21 (ref. 12); 3.14 (ref. 11) and 3.30 (this work)  
Melting point: 118 dec without melting; 122 melt (this work)  
Crystal structure: octahedral with one monodentate nitrate  
and one bidentate nitrate; mer configuration  
IR combination bands: 1734 and 1751 (monodentate); 1716 and 1764 (bidentate  
nitrate) (this work); 1710 and 1747 (monodentate); 1699 and 1765  
(bidentate nitrate) (ref. 2)  
Result: octahedral nickel

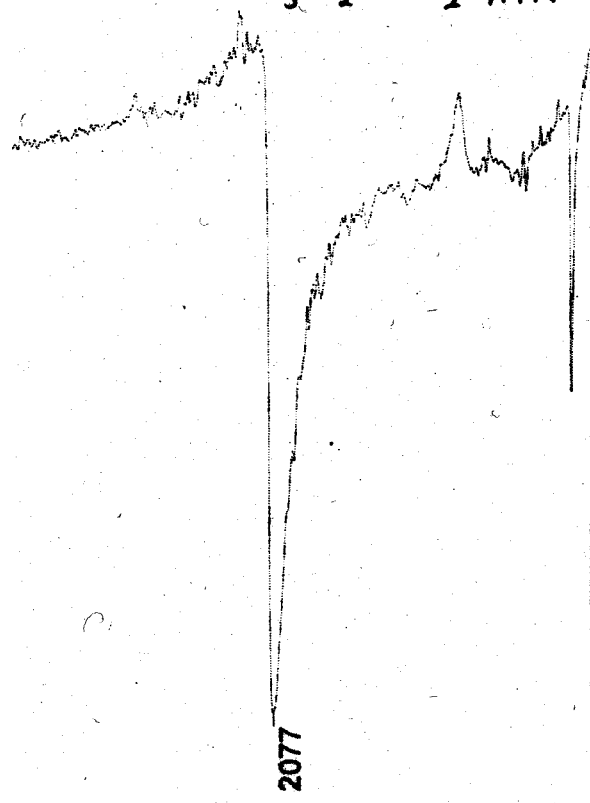
#### 8. $\text{Co}(\text{py})_3(\text{NO}_3)_2$

Conductance in nitromethane: 11 (ref. 12)  
nonelectrolyte  
Magnetic moment: 4.60 (ref. 12); 4.56 (ref. 15); 4.86 (this work)  
Melting point: 118 dec without melting; 125 melt (this work)  
IR combination bands: 1732 and 1751 (monodentate nitrate); 1716 and 1763  
(bidentate nitrate) (this work)  
Isostructural with the nickel compound  
Result: octahedral cobalt

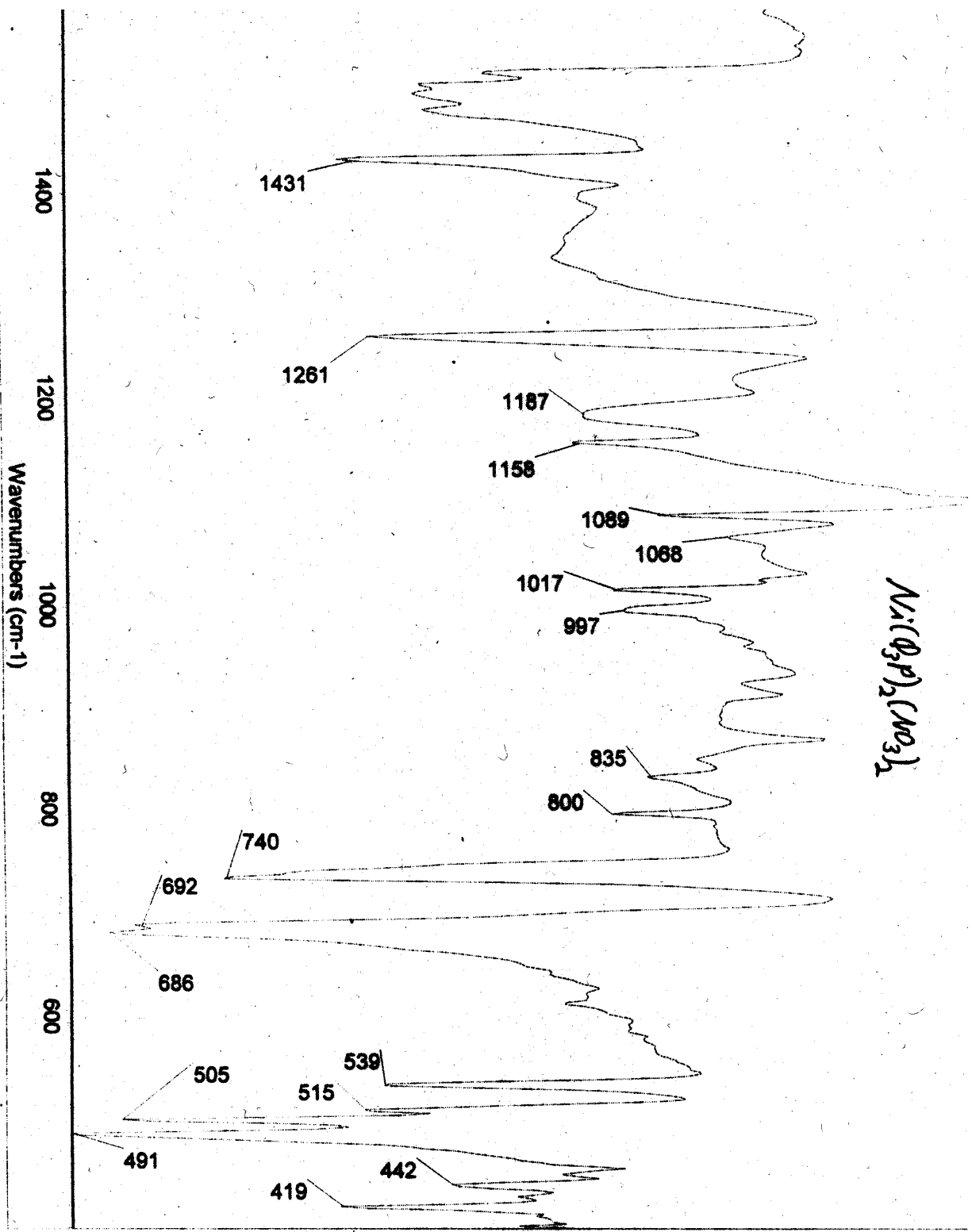
## References

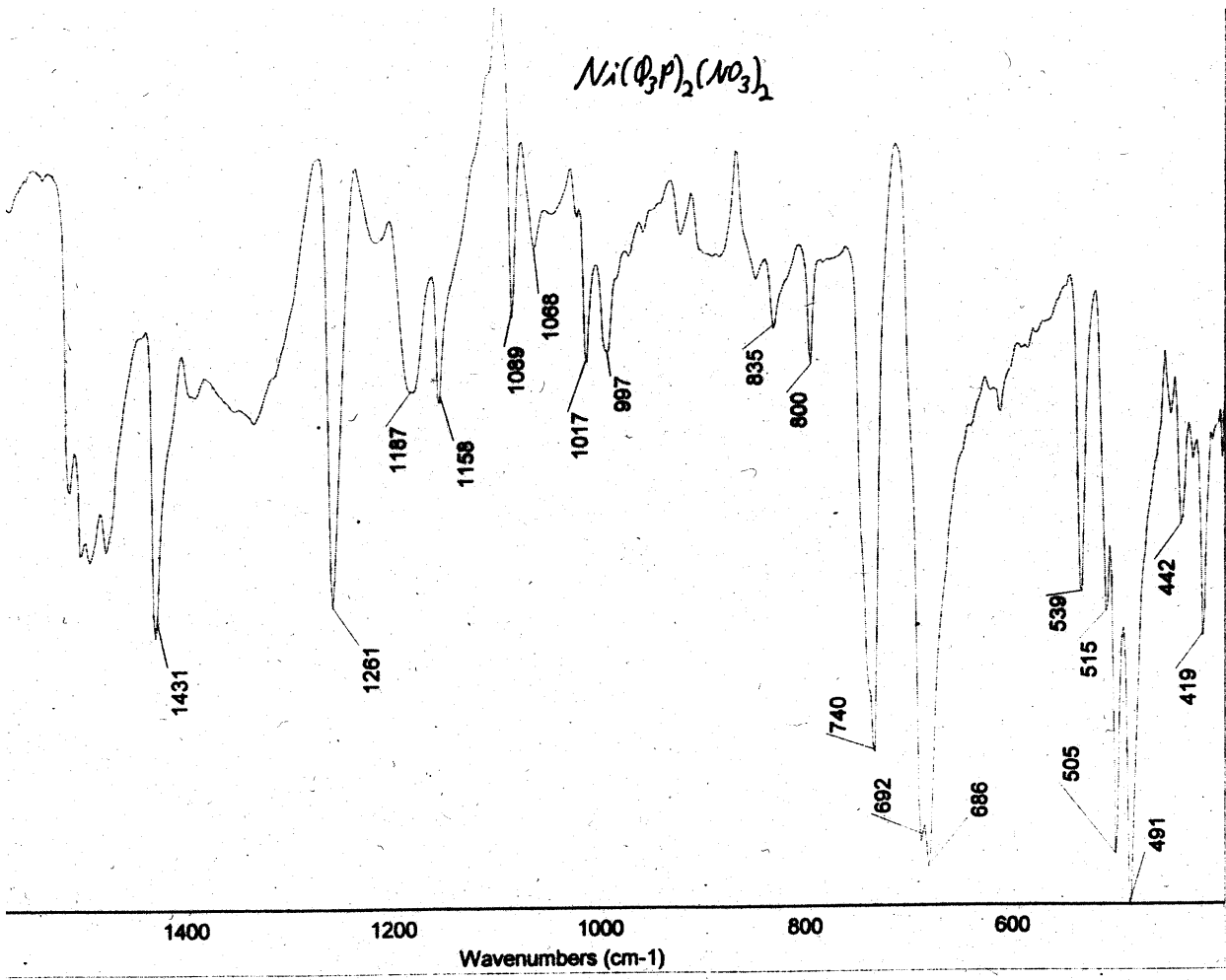
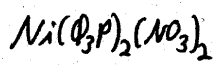
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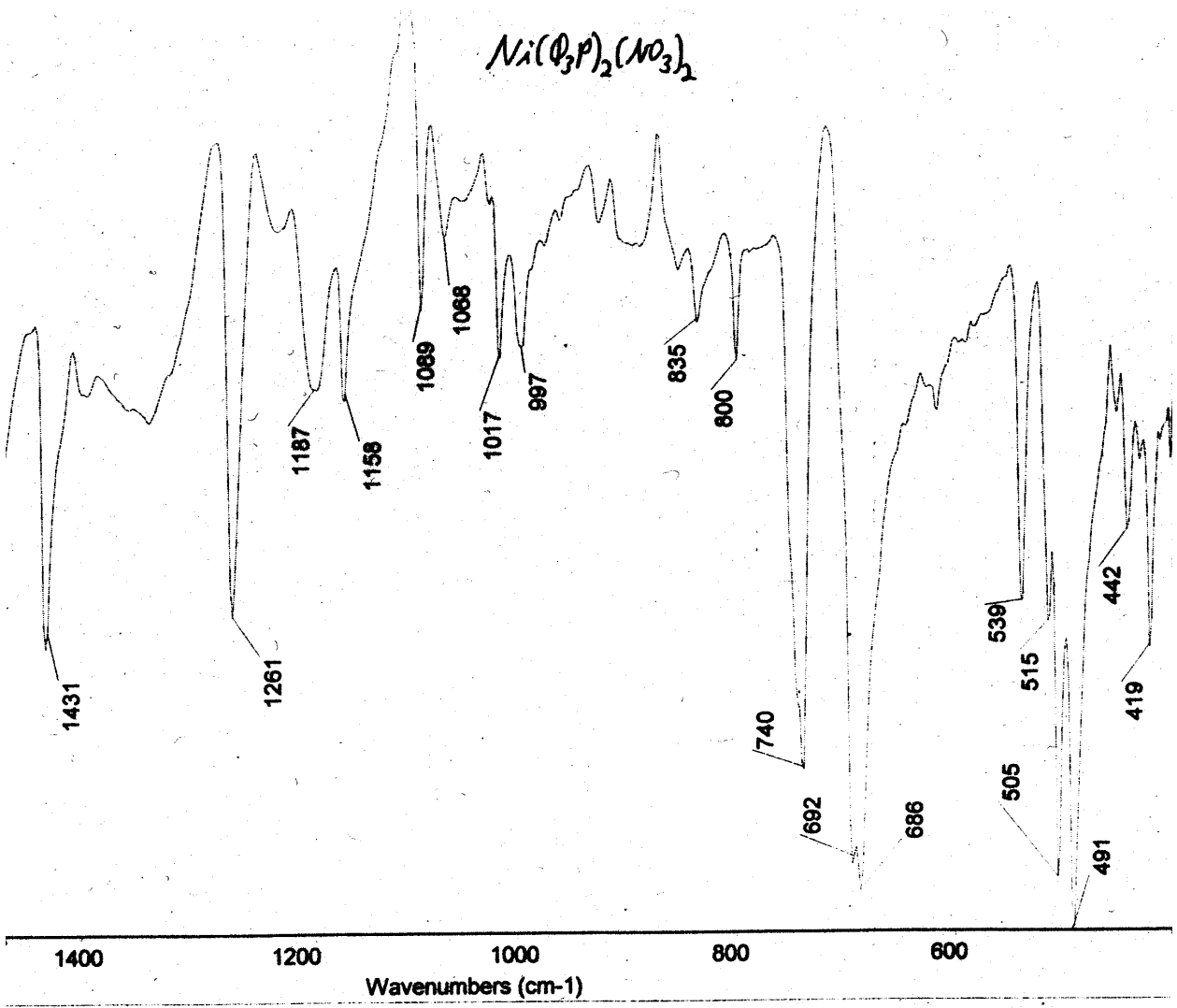
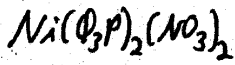
$\text{Ni}(\text{O}_3\text{P})_2(\text{SCN})_2$  ATR



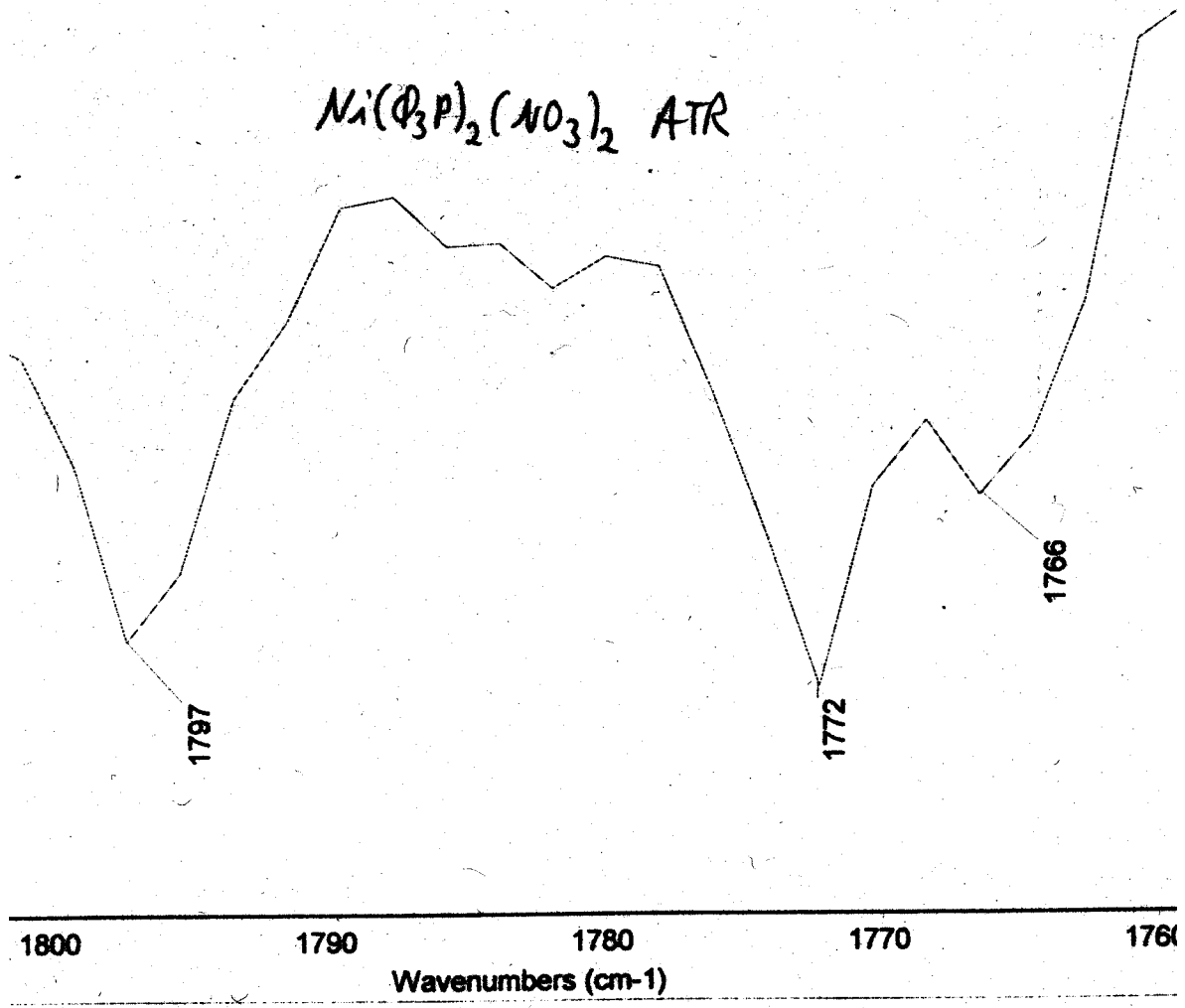
2500                      2000                      1500  
Wavenumbers ( $\text{cm}^{-1}$ )



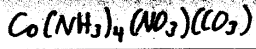




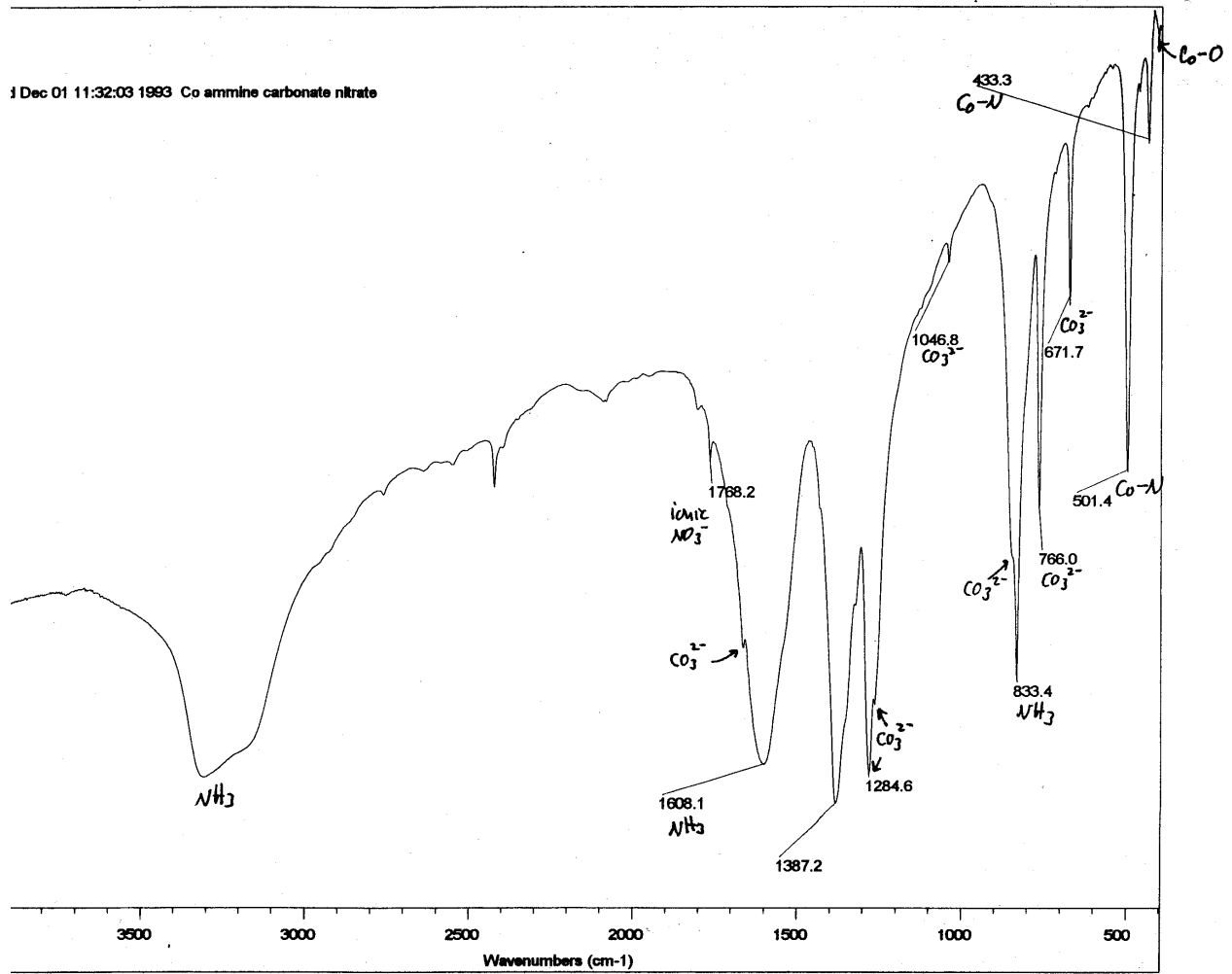
$\text{Ni}(\text{O}_3\text{P})_2(\text{NO}_3)_2$  ATR

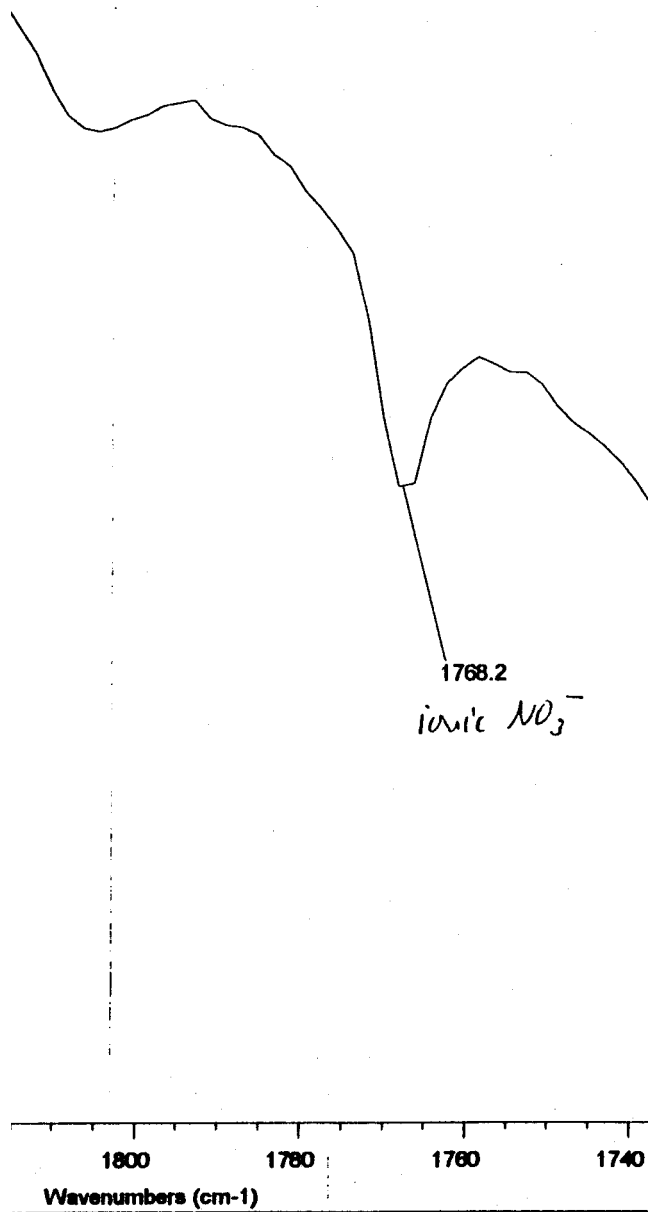
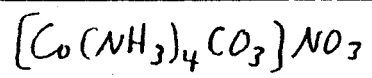




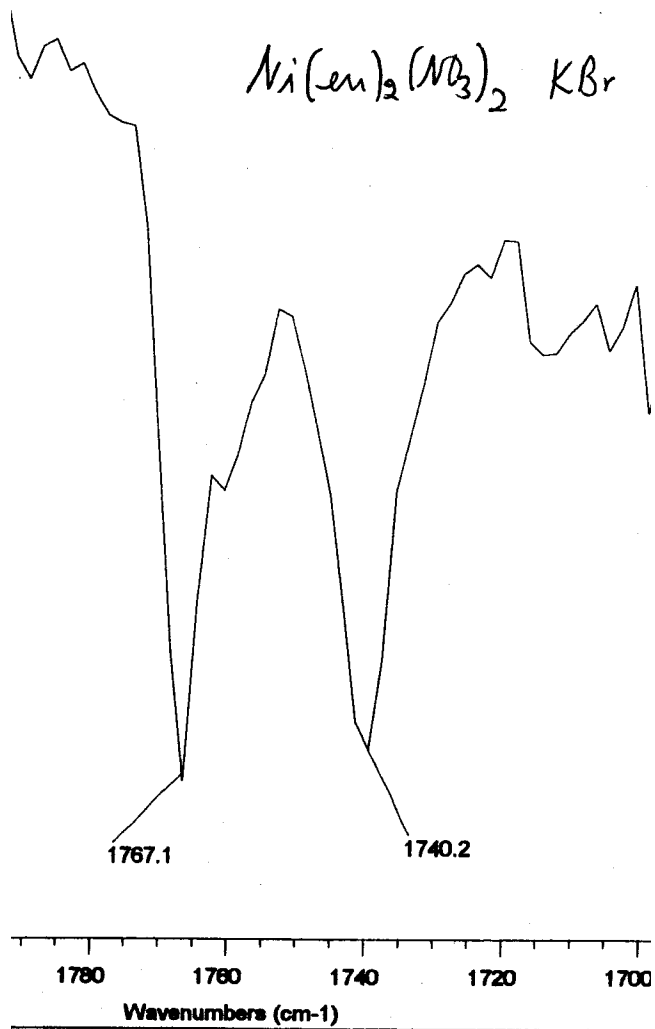


1 Dec 01 11:32:03 1993 Co ammine carbonate nitrate

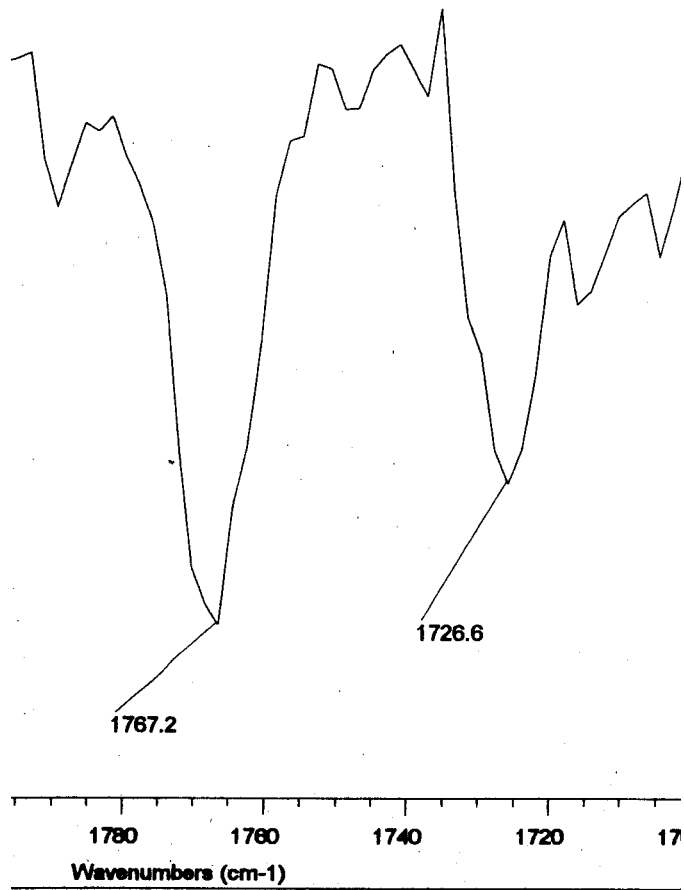


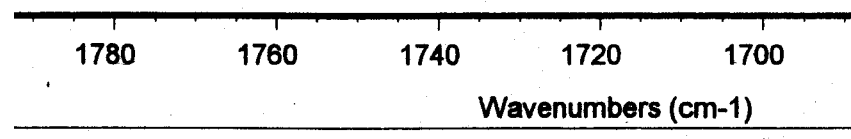
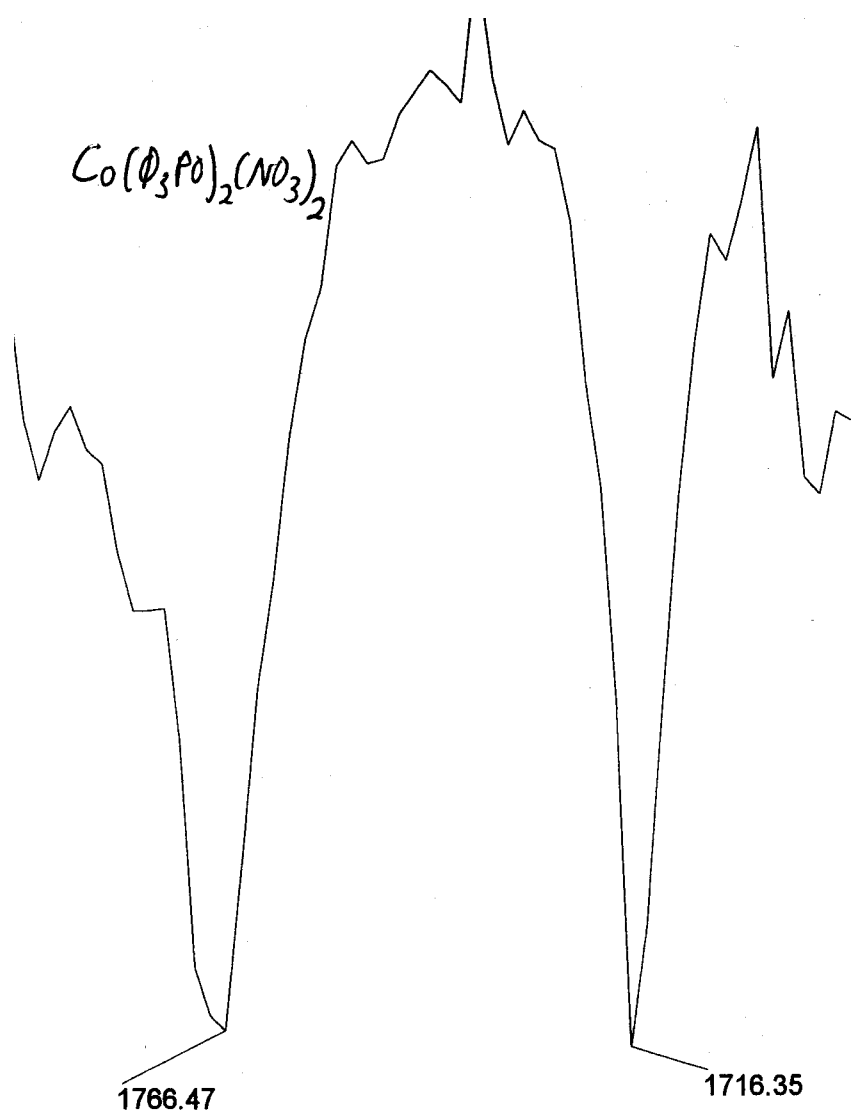
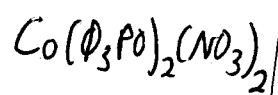


$Ni(en)_2(NO_3)_2$  KBr



$Ni(en)_2NO_3 \cdot I$  KBr





$Ni(py)_3(NO_3)_2$  ATR

